DOCUMENT RESUME

ED 379 518 CE 068 371

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TITLE Project VISIONS. Enhancing Your Employment through Educational Opportunities. Instructor's Guide, Student Workbook, and Resource Manual for the Numbers and Charts Course.
INSTITUTION Orangeburg-Calhoun Technical Coll., Orangeburg, SC.
SPONS AGENCY Office of Vocational and Adult Education (ED), Washington, DC. National Workplace Literacy Program.
PUB DATE 94
NOTE 123p.; For related documents, see CE 068 362-367 and CE 068 370-373. Printed on colored paper.
PUB TYPE Guides - Classroom Use - Teaching Guides (For Teacher) (052) -- Guides - Classroom Use - Instructional Materials (For Learner) (051)

EDRS PRICE MF01/PC05 Plus Postage.
DESCRIPTORS Adult Basic Education; *Adult Literacy; Allied Health Occupations Education; Charts; Computation; General Mathematics; *Hospital Personnel; *Learning Activities; *Literacy Education; *Mathematical Concepts; *Mathematics Skills; Medical Services; Numeracy; Thinking Skills
IDENTIFIERS *Workplace Literacy

ABSTRACT

This packet contains four products of a workplace literacy course on numbers and charts for hospital workers. The instructor's manual contains an answer key for the student activities, and a pre- and post-evaluation, along with a syllabus for the 13-week course that provides information on instructional goal, course description, objectives, rationale for the course, grading system, and major curriculum topics. The student workbook provides 42 activities that hospital workers can use in a classroom setting to improve their mathematical and chart interpretation skills. The activities are designed to help students improve their thinking and problem-solving skills, their abilities to read charts and measurements in the workplace, and to maintain a handbook of terms to assist them in understanding number context. A resource manual provides documents that hospital personnel typically encounter on the job. (KC)

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ED 379 518

Project VISIONS
Enhancing Your Employment through Educational Opportunities

Instructor's Guide, Student Workbook, and Resource Manual for the Numbers and Charts Course

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The Regional Medical Center/
Orangeburg-Calhoun Technical College

INSTRUCTOR'S GUIDE

For

The Numbers and Charts Course

Developed by Edmund Vitale, Jr.
Gaithersburg, Maryland

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THE REGIONAL MEDICAL CENTER
COURSE OUTLINE - CYCLE II
"NUMBERS AND CHARTS"
IMPROVING MATH SKILLS FOR THE WORKPLACE

I. Instructional Goal:

Students will improve their thinking and problem-solving skills. They will improve in their abilities to read charts and measurements as they relate to the workplace. The students will also maintain a handbook of terms to assist them in understanding number context.

II. Course Description:

This is a thirteen week course where the students will meet twice per week for one and a half hours each session. This course is intended to stimulate the students to apply the classroom activities in numbers and charts to their everyday situations in the workplace.

III. Course Objectives:

Learners will be able to:

* Utilize problem-solving strategies
* Identify the way numbers and charts are used in the workplace
* Recognize mathematical terminology
* Understand the context of math problems

IV. Why Take This Course:

The fundamentals taught in this course are skills that are needed in all areas of life. Continued improvement in these skills results in a better understanding of your surroundings and could lead to greater opportunities in and out of the workplace.

V. Grading System:

There will be no emphasis placed on grades! The emphases will be placed on improvement of a specific skill. At the end of each competency, an evaluation will be given to measure the students' amount of improvement. You will see statements such as the following on any papers corrected:

Excellent
Very Good
Good
Needs Some Work

VI. Course Overview:

Week 1	* Ice-Breaker activities * Enrollment forms filled out * Discussion of course outline * Give Pre-Evaluation
Week 2	* Introduction of curriculum * Organizing information -- classification * Understanding Numbers Context -- labeling * Lesson 1 - complete exercises, pages 1-4
Week 3	* Review Lesson 1 * Understanding Number Context -- categorization * Thinking in Context * Lesson 2 - complete exercises, pages 5-8
Week 4	* Review Lesson 2 * From numbers in class to numbers at work * Using numbers to organize and convey information * Words that require numbers in documents * Lesson 3 - complete exercises, pages 9-10
Week 5	* Review Lesson 3 * Using numbers to organize information - calendar * Lesson 4 - complete exercises, pages 11-14
Week 6	* Review Lesson 4 * Using numbers to set priorities * Using numbers to convey information -- time * Lesson 5 - complete exercises, pages 14-18
Week 7	* Review Lesson 5 * Explore and explain MSDS forms * Numbers in the context of MSDS forms * Lesson 6 - complete exercises, pages 19-22
Week 8	* Review Lesson 6 * Understanding the context of math problems * Thinking about math * Lesson 7 - complete exercises, pages 22-25
Week 9	* Review Lesson 7 * Understanding the context of math problems * Thinking about math * Lesson 8 - complete exercises, pages 25-27
Week 10	* Review Lesson 8 * Thinking about math * Lesson 9 - complete exercises, pages 27-29

Week 11	* Review Lesson 9 * Thinking about math * Lesson 10 - complete exercises, pages 29-31
Week 12	* Review Lesson 10 * Thinking about math * Lesson 11 - complete exercises, pages 31-35
Week 13	* Review Lesson 11 * Give Post - Evaluation

THE REGIONAL MEDICAL CENTER
PRE-EVALUATION
NUMBERS AND CHARTS COURSE

Name: _____ **Date:** _____

I. Below are six words common to math. Place the letter of the definition in the space beside the correct word.

1. Fraction ____	A. to increase in number
2. Decimal ____	B. one part in a hundred
3. Percent ____	C. fraction that uses a point or period
4. Multiply ____	D. to subject a number to the operation of finding how many times it contains another number
5. Divide ____	E. to take away one number from another
6. Subtract ____	F. a part or portion of a larger number

II. Below are groups of numbers with symbols. Determine what each group of numbers and symbols has in common and write the most accurate label for each group on the line provided.

7. _____

1/4
1/2
3/4

8. _____

.25
.50
.75

9. _____

25%
50%
75%

10. _____

12 = 1
3 = 1
100 = touchdown!

11. _____

60 = 1
60 = 1
24 = day

12. _____

3 East
3 West
4 West

13. _____

1 oz./gal.
16 oz./gal.
1 part to 3 parts

14. _____

1 = 3.8
5 = 18.9
30 = 113

15. _____

32
98.6
212

16. _____

one-half
three-quarters
one-tenth

III. PROBLEM SOLVING

17. How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean the tiles on the kitchen walls? Read the label instructions below and circle the one you should use for this job.

a.	wall (painted and ceramic)	1-3 oz/gal
b.	floors (resilient and mineral) -- light soil	2-4 oz/gal
c.	floors (mineral) -- heavy soil	30-40 oz/gal

18. The product FloorStar DuoClene has the following mixing instructions:

FOR SHOWER SCRUBBING – Mix 5 oz. of DuoClene with water to make 1 gallon; use mixture for shower scrubbing.

a. How much water will you use to make a gallon of the mixture? Write your answer below.

19. The directions on the label of GlassClene Pro states:

1 part GlassClene to 3 Parts Water.

a. If you had a four gallon jug in which to mix the product, how much water and how much GlassClene Pro would you use? Write your answer below.

20. How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean a mineral floor that is lightly soiled? Read the label instructions below and circle the one you should use for this job.

a.	wall (painted and ceramic)	1-3 oz/gal
b.	floors (resilient and mineral) -- light soil	2-4 oz/gal
c.	floors (mineral) -- heavy soil	30-40 oz/gal

THE REGIONAL MEDICAL CENTER
POST-EVALUATION
NUMBERS AND CHARTS COURSE

Name: _____ **Date:** _____

I. Below are six words common to math. Place the letter of the definition in the space beside the correct word.

1. Fraction ____	A. to increase in number
2. Decimal ____	B. one part in a hundred
3. Percent ____	C. fraction that uses a point or period
4. Multiply ____	D. to subject a number to the operation of finding how many times it contains another number
5. Divide ____	E. to take away one number from another
6. Subtract ____	F. a part or portion of a larger number

II. Below are groups of numbers with symbols. Determine what each group of numbers and symbols has in common and write the most accurate label for each group on the line provided.

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1/2
3/4

8. _____

.25
.50
.75

9. _____

25%
50%
75%

10. _____

12 = 1
3 = 1
100 = touchdown!

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11. _____

60 = 1
60 = 1
24 = day

12. _____

3 East
3 West
4 West

13. _____

1 oz./gal.
16 oz./gal.
1 part to 3 parts

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c.	floors (mineral) -- heavy soil	30-40 oz/gal

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The Regional Medical Center
Project VISIONS
The Numbers and Charts Course

Developed by Edmund Vitale, Jr.

AN INTRODUCTION - WHERE YOU HAVE BEEN AND WHERE YOU ARE GOING!

We are going to take advantage of your vocabulary, dictionary, and other thinking and problem-solving skills learned in the VOCABULARY course and transfer them to help you explore numbers, math, and charts that occur on your job. You will be asked, at first, non-math questions about number and math situations just to get you thinking about numbers and math. Later, you will get more practice and drills in math problems. Don't forget that one of the major objectives in these courses is to get you to THINK AND UNDERSTAND about the subject, not just do drills.

Transferring skills from one course to another and from the classroom to the work place is a major goal of this workplace project. Thinking about transferring skills will help you think and problem-solve within the context of work and use what you already know to help you solve new problems. So we will be continually asking you how the skills you learned in the vocabulary course can be used in a math course and how the skills you learned in the classroom can be used on the job.

ORGANIZING INFORMATION -- CLASSIFICATION

1. One of the major skills you learned in the vocabulary course is to organize information and words in different ways. List at least two ways that you organized (or classified) the words in the vocabulary course.

(For example: alphabetizing; classifying words according to where they were used in the hospital.)

2. Can numbers be used to organize information? Give an example.

(Yes. For example, outlines use numbers to organize information and show relationships of the material; most forms have numbered blocks. etc.)

3. Does the hospital use numbers to organize information? List as many ways as possible the Hospital uses numbers to organize information.

(Yes. For example: Floor numbers, patient rooms, etc.)

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DISCUSS: Discuss with the class how both numbers and letters are useful to organize information. Talk about how numbers and letters are similar in organizing information and how they are the different. Be prepared with as many examples of the use of letters and numbers to organize information as possible. Note here any new ways to organize information that you get from the class discussion.

UNDERSTANDING NUMBER CONTEXT -- LABELING

In the vocabulary course, you did labeling and categorization exercises using words. Do you think you can do the same kind of exercises with numbers? First, we'll try using a labeling exercise with numbers. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 18 and 19 [pages 19 and 20] and reread the steps you went through to solve these labeling problems. (This is an example of using the skills you have already developed to learn about math!)

4. Here are groups of numbers and/or groups of numbers with symbols and/or words (which we will call number phrases). Determine what each group of numbers or number phrases have in common and write the most accurate label for each group on the line above. In other words, try to determine the context, the situation, in which these numbers might occur; this will give you a clue as to the label that could describe them. The very first problem is from the vocabulary course and is included as an example!

(Use these exercises as ways of uncovering areas that participants want more help with; if they want some more drill or practice with anything raised by these exercises, follow through with it.)

Hospital Telephone	Fractions or
A. Extensions	B. Ruler marks
2430	1/4
2422	1/2
	3/4
Decimal equivalents of Fractions in B, or	Percent equivalents of Fractions & Decimals in B & C, or
C. Decimals	D. Percents
.25	25%
.50	50%
.75	75%

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E. Inches to feet to yards
12 = 1
3 = 1
100 = touchdown!

F. Seconds to minutes to days
60 = 1
60 = 1
24 = day

G. Locations in Hospital
3 East
3 West
4 West

H. Mixture rates on labels
1 oz./gal.
16 oz./gal
1 part to 3 parts

Gallon to liter equivalents
I. found on labels
1 = 3.8
5 = 18.9
30 = 113

Degrees or
J. Fahrenheit Temperature
32
98.6
212

Money equivalent of
K. Written Fractions
one-half
three-quarters
one-tenth

L. written factions
half dollar
three quarters
dime

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these "number" problems and the way you solved the vocabulary problems.

(For example: Might not be any difference in trying to find the relationships among the choices. Can't use a dictionary too often with these math exercises.)

UNDERSTANDING CONTEXT

DISCUSS: The box that introduced these labeling exercises said: "Understanding Number Context." What does "context' or "the context of the situation" have to do with solving these labeling problems?

(Have to know what situation the numbers are being used in to make sense of the numbers. If you don't know the situation, then the numbers don't make much sense.)

Give an example or two from exercise 4 that indicates the context of the numbers leads to its solution.

(For example: A [inches to feet to yards] and G [wings of the hospital].)

DISCUSS: Please take some time to think about and discuss the concept of number context because you will be (1) looking at hospital contexts and situations that involve numbers, and (2) attempting to solve the problems from a math point of view. You will viewing these problems in the way a math person would. This means math is not the only way to solve a problem, but that it is one way to do so and we will learn more about the "math context" way to solve the problems in this class.

(For example: Haven't thought too much about math context, only multiplication tables and calculation skills. This way doesn't help me with calculation skills. OR This method does help me to think about numbers in a new way that I can make sense of.)

THINK LIKE A TEACHER

5. You are going to continue to think like a teacher, but now you are going to start to think in the context of a math teacher! Prepare 3 or 4 three number or number phrase groups like those in exercise 4 using situations from around the hospital. Your instructor will choose one or two of your number labeling groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.

THINK LIKE A LEARNER

This new series of exercises -- Think Like A Learner -- will help you focus on what YOU learned about thinking, learning, and transferring skills from one context to another. Don't be limited to what was specifically being taught in the classroom or in this text. Take all this material and make it relevant to YOU; and what is relevant to you may not be what is directly being taught. If something you already know "clicked" in a new way, make note of that!

6. What was the most interesting thing you learned from these exercises so far?

(Encourage answers that are relevant to the participants, not necessarily the course. Try to show the participants that what they think about the course and what they are learning are important even if what they are learning is not just the "objective" of the lesson. They need to get out of this course the material that will help them.)

7. What was the most interesting thing you learned that was not directly a part of the exercise, something old that clicked in a new way?

(Again, encourage a wide variety of answers. The participants have to feel comfortable with being able to express themselves on their issues. This helps set the atmosphere where "mistakes and wrong answers" are learning opportunities, not examples of failing in school.)

DISCUSS: Discuss with the rest of the class your answers to the above two questions.

UNDERSTANDING NUMBER CONTEXT -- CATEGORIZATION

Now we are going to try to do a categorization exercise with numbers instead of words. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 21 and 22 [pages 22 through 24] and reread the steps you went through to solve these categorization problems. To repeat, this is an example of using the skills you have already developed to learn about math and number context!

8. Don't forget you have to have a reason for picking the number or number phrase that doesn't fit within the context of the other numbers or phrases. You instructor will make available some math books for you to use as a resource to answer some of these problems. You may even need your dictionary for some of these problems!

(Use these exercises as ways of uncovering areas that participants want more help with; if they want some more drill or practice with anything raised by these exercises, follow through with it.)

A.
1/3
.5
50%
1/2

REASON: (For example: .5, 50%, and 1/2 all represent the same amount. 1/3 does not and should therefore be crossed off.) (Have students give other fraction, percent and decimal equivalents if they can. Don't press it if this is too hard.)

B. decimate
quarter
multiply
divide

REASON: (For example: decimate, quarter, and divide are all examples of taking apart or reducing or dividing, Multiply means to increase.)
(Have students put these words and other math word in their Personal Handbook. Helps to relate math in part to vocabulary building and helps build math context.)

C. part
add
decimal
fraction

REASON: (Add, to increase, is out because all the other words relate to parts of things.)
(Have students think of similar math words and add them to their vocabulary list.)

D. $.50
$.05
$.75
$.25

REASON: ($.75 should be crossed out because the other amounts are each represented by a specific coin.)
(Have participants try to understand that our money system is a decimal system. If they know money, they know decimals.)

E. +
--
#
⌐¯¯¯

REASON: (The # sign should be crossed out since it is not a math function sign like the rest of the symbols.)
(Ask if the participants know other math symbols. Could also add these symbols to their Personal Handbook.)

F. 1/2
5/10
1/3
8/16

REASON: (1/3 should be crossed out since the other fractions are fractions equivalents.)
(Use this question as an opportunity to teach about fraction equivalents. Ask them for how they think they can make fraction equivalents.)

G. 1 = 3.8
5 = 18.9
10 = 50
30 = 113

REASON: (These are the gallon/liter equivalencies which are on cleaning labels. 10 = 50 is not a proper equivalency in this context.
(Ask participants how you do these; how they are related to fraction equivalencies.)

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these categorization "number" problems and the way you solved the categorization vocabulary problems?

(For example: Again, no dictionary; but since I have done the exercise with words, it helped me to do it for the math examples.

THINKING ABOUT THINKING IN CONTEXT

9. Read the following statement and be prepared to discuss what you think it means.

> The thinking skills that are the same in solving the vocabulary and number categorization exercises are thinking skills that are more general and can be applied to many other contexts and situations. The thinking skills that are different means that they are related more to the context in which they arise.

(For example: The more useful a thinking skill is in many situations, the more general it is. Math seems to have a lot of skills that are related to math exclusively.)

10. Make a list of the "general thinking skills" that you can be used in many situations and give an example or two other "contexts" or situations in which each general skill you list can be used.

(For example: Skills of comparing, using resources, finding contexts, looking for relationships are all general skills. These can be used in finding and using information in sources from recipe books to computer manuals.)

11. **Make a list of the thinking skills that you believe are more related to the math context.**

(For example; comparing numbers, trying to understand the abbreviations associated with math contexts, trying to understand the math context of words , etc.)

DISCUSS: **With the rest of the class, discuss your interpretation of the quote in exercise 9 and your list of general (exercise 10) and your math thinking skills (exercise 11). Place all the math thinking skills that the class developed in the space below.**

(For example: In addition to the skills participants may come up with above, can encourage them to say that adding, subtracting, dividing, and multiplying are math thinking skills. Need to know how to do those calculations to be able to think like a mathematician.)

THINK LIKE A TEACHER

12. **Prepare 3 or 4 number or number phrase groups like those in exercise 6 using situations from around the hospital. Make one of the four numbers or words in the groups not fit with the others. Your instructor will choose one or two of your number categorization groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.**

(Pick from each learner the groupings that are correct and/or show ingenuity in viewing the math terms picked. Try to hold private conversations about the ones that are obviously incorrect. Use these incorrect ones to suggest help to the individual student.)

THINK LIKE A LEARNER

13. **Was it easier to answer the book's categorization problems in exercise 8 or was it easier to develop your own categorization problems? Why? Doing which activity did you feel that you learned more?**

(Make sure students always give reasons for their answers, or can support them in some way.)

FROM NUMBERS IN CLASS TO NUMBERS AT WORK

To this point, we have explored many kinds of numbers, attempting to create a context to try to better understand the numbers. We have seen how numbers are used to organize information (floor numbers, telephone numbers, the numbers of these exercises, etc.), and we have seen how numbers convey information (fractions, percents, money, etc.). When numbers are used to organize or convey information, they are always used in conjunction with other words, symbols, or abbreviations which supply the context of numbers we have been exploring. Numbers don't mean anything without the context.

For example, if we say 55, that is a meaningless number. If, however, I say 55 mph, now we can translate the abbreviation, come up with "miles per hour", and understand that 55 mph might be a reference to a speed limit on the road.

The numbers we explored so far were number activities found in the classroom. Now, we are going to explore numbers, how they are used, and what they mean, in a very specific context: your workplace.

USING NUMBERS TO ORGANIZE AND CONVEY INFORMATION

14. The first workplace document you will explore is the Job Description for Housekeeper I found in your Resource Manual. Your instructor will divide the class into two groups. One group will circle all the numbers found on the job description that organize information and will be prepared to explain to the rest of the class how the numbers are used to organize. The other group will circle all the numbers that convey information and will be prepared to explain to the rest of the class what information is being conveyed by the numbers. If some numbers might convey information and at the same time organize information, both groups should be prepared to state how the numbers do that.

(Besides some of the obvious numbers, don't let students forget the street address and the zip code in the address at the top, the dates when written and revised on top of the first page, or the dates when the documents were approved on the last page.)

DISCUSS: Each group will makes its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

WORDS THAT REQUIRE NUMBERS IN DOCUMENTS

15. The next document you will explore is the Blue Cross Blue Shield Dental Services Claim Form, found in your Resource Manual. Your instructor will divide you into two groups. One group is to find all of the *words* on the form that require the person filling it out to insert numbers. The group should be prepared to explain what kinds of numbers are required and what they mean. The other group is to study the diagram in the middle of the page against the right hand margin, explain what the diagram represents, determine what the numbers and letters represent, and, finally, how that information is used in other places on the form. This group is also to explain the service codes on along the bottom of the page and determine where they are to be used on the form.

DISCUSS: Each group will make its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

(There's a lot of information here. It is not a matter of having them get all the numbers and words requiring numbers but to give them practice in looking at documents from this perspective. Some of the important numbers are the ones in each answer block; some of the important words requiring numbers are the ones in blocks 4, 8, 11 [SS#], 17. Can discuss, if you think they are ready, all the numbers [in the blocks at the bottom of the page] the dentist has to be concerned with.)

USING NUMBERS TO ORGANIZE INFORMATION: THE CALENDAR

16. The next document you will explore is the Grievance Procedure portion of the Personnel Policy Regulations found in your Resource Manual. Skim the document briefly, circle all the numbers found in the document, and then read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. Why does the policy number change on each of the pages?

(Let students make attempts at these answers first before guiding them to the answer. For example: Because the numbers after the decimal indicate the page number.)

    b. Explain how numbers and letters are used to organize information in the outline form the document uses? Be prepared to explain each level of the outline and how the numbers and letters show relationships among information.

(This question is getting the students to see how combinations of numbers and letters can be used precisely to organize information and show relationships among information.)

    c. Under roman numeral IV., explain the difference between "ten (10) calendar days" (as found in First Step) and "five (5) working days" (as found in First, Second, and Third Step).

(This is a "legalistic" type question, but it is something found in many documents including warranties. It might be interesting to hear the responses to the five working days answers by participants who work on weekends.)

DISCUSS: Share your responses with the rest of the class. Determine whether the numbers referred to in questions a, b, and c are used for organizing information or for conveying information. Note in the space below anything new you have learned during the discussion.

(a--organizing information, the page numbers; b--of course, is organizing information; c--is conveying information, the time limitations.)

17. Based on the definitions that you have suggested for "calendar days" and "working days" in part IV. of the Grievance Procedure, work through the situations below and answer the questions. You will need a 1994 calendar for this task.

    a. An employee thinks he has a grievance on January 25th, 1994. Give the date of the last day he can present his concern to his immediate supervisor or department head. Be prepared to explain how you arrived at your answer.

(For example: This part of the problem deals with calendar days. On the calendar, I found the 25th of Jan. I started counting from the next day until I counted 10 days. When I reached 10, the date is February 4, 1994, the last day the employee can present his grievance.)

    b. The employee has filed his grievance on January 27th. What is the latest date the supervisor or department head can render a decision? Be prepared to explain how you arrived at your answer.

(For example: This part of the problem deals with working days. On the calendar I found January 27th. That day is on a Thursday. The next day is a Friday which is a working day and so I started counting from Friday. I then skipped to Monday since that is the next working day and that is day 2. I continued to count until I got to 5, I found five working days after January 27th to be Thursday, February 3, 1994.)

    c. This matter goes all the way to Fourth Step where the Medical Center President has to write a decision. The administrative staff reached a decision on February 9, 1994. What is the latest date the Medical Center President can render his or her decision? Be prepared to explain how you arrived at your answer.

(For example: This part of the problem doesn't use the term calendar days or working days. So I will have to assume it means calendar days. February 9 is on a Wednesday. Starting with the 10th, I will count five days. The decision would have to be given by February 14th, if five calendar days is meant. If five working days is meant, then the date may be February 16th.)

DISCUSS: Discuss your answers to these questions with the rest of the class. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

18. Calendars use numbers to organize time. As seen in the Grievance Procedure, numbers had to be translated to calendar dates to set the time limits for various stages of the Grievance Procedure Process. A calendar is one kind of chart organizing time, but it is not the only way to organize time. The Regional Medical Center has devised it's own form to organize time for the specific purpose of scheduling when employees will report to report to work and when they are off from work. This chart is called the Working Schedule, a blank copy of which is in your Resource Manual.

    The instructor will divide you into groups. Using a blank Working Schedule, each group is to fill in the beginning and ending dates, the month row, the date row, and the time off of specific employees based on the information below. You will need a 1994 calendar for this task.

    > The work period runs from the third Monday in March (1994) for six full weeks. Employee Carie Smith does not work Saturdays or Sundays during this period. Francis Jones doesn't work on Fridays and works alternating Saturdays and Sundays starting the first weekend. Diane Thompson doesn't work on Mondays and works alternating Saturdays and Sundays starting the second weekend.

    Concentrate on how words are used to convey information to be translated into dates (as in the Grievance Procedure exercise). Each member of the group should be prepared to defend the work of the group by being able to explain the steps used to arrive at each decision that was made and be able to support the each decision.

(I don't have a blank one to fill in, but I took the situations from the ones you had copied for me. If there are any problems, call.)

DISCUSS: Your instructor will call on individuals to explain each of the blanks that were required to be filled in. Other members of the group should be available to support the group member who was called on. Note below interesting approaches to the decisions that were made.

DISCUSS: Can you think of other ways to organize the Work Schedule that would make it easier to complete or easier to follow?

THINK LIKE A TEACHER

19. Bring to class similar work or inventory organizing charts used in your work or which others in your area use. Be prepared to make a presentation to the class to explain how your chart is constructed and how it uses numbers to organize or convey information. Use the space below for notes from charts you find of interest.

USING NUMBERS TO SET PRIORITIES

20. The Weekly Inspection Report uses numbers in a different way from what we have analyzed so far. Find the Weekly Inspection Report in your Resource Manual. Skim the document *briefly* and then break into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. What is the total of each of the columns of figures that are preprinted in each box? Is there any other place in the document that indicates what those totals might be?

(For example: 100. On the back of the document [or the second page if photocopied], it shows that 100 is a possible score for each of the areas mentioned on the front.)

    b. For what purpose are the numbers used in each of the four boxes?

(For example: These scores are the top scores a worker could get for the inspection of each of the items listed. If my work isn't perfect, it would receive points lower than the maximum amount shown for that particular task.)

c. **Which activities in the "Entrance Lobby" is the most important? How do you know?**

(For example: The most important activities seem to be finishing the floor with a deep shine, clean public rest rooms, and clean corners and baseboards . These 3 items have the highest possible points so I figured they must be the most important.

d. **List below the activities in the "Patient Rooms" in their order of importance? Be prepared to explain how you arrived at the order of your list.**

(For example: The item numbers of the activities in the Patient Rooms in order of importance are: item 8 with a score of 14, items 7 & 10 tied with a score of 12, items 1, 2, 5, & 9 with a score of 10, items 4 & 6 tied with a score of 8, and item 3 with a score of 6.)

e. **Out of all the activities in all four boxes, which activity do you think is the most important? How do you know?**

(For example: The most important item seems to be corridors, item 1: "Corridors finished with a deep shine". It is the only item that has a possible score of 20 points.)

f. **Using all four boxes, list the six most important activities? How do you know?**

(For example: The six most important items are: Corridors, item 1 (20 Points); Entrance, Lobby, items 6 and 8 (15 points), item 7 (14 points); Patient Rooms, item 8 (14 points); and Departments and Offices, item 9 (14 points).

g. **Try to find a pattern in the information you obtained from exercise e and f above? Explain in specific detail the pattern you see. If your group finds more than one pattern, be prepared to explain them.**

(For example: Seems that the public areas, especially the floors, are the most important.)

DISCUSS: **Each group will be called on in turn to answer these questions until all questions have been answered and the discussion is complete to everyone's satisfaction. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.**

USING NUMBERS TO CONVEY INFORMATION: TIME

21. The next document we will examine from the point of view of numbers is the Cafeteria Benefits Policy found in your Resource Manual. This document uses time to convey when the cafeteria is opened for employees and visitors. Skim the one page document briefly and break into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions.

    Each group should also be prepared to explain in detail all the steps and all the calculations used to arrive at each of the answers called for.

    a. How many hours is the cafeteria available for a coffee break for employees?

(For example: 2 hours.)

How many minutes is that?

(For example: 120 minutes. 2 x 60 minutes; or 60 min + 60 min.)

    b. How many hours is the cafeteria available for employee breakfast?

(For example: 1 hour, 45 minutes; or 1 and 3/4 hours; or two hours - 15 minutes.)

How many minutes is that?

(For example: 105 minutes; 60 + 45 minutes; or 60 min x 2 - 15.)

Did you have any difficulty in answering the first part of this question? Why?

(Try to find how they handle the 45 minutes, fractions of an hour, since the base period is 60 rather than 100.)

    c. Expressing an answer in hours, what is the difference between the time the cafeteria is opened for dinner to employees and to visitors?

(For example: The cafeteria is opened for 2 1/2 hours for employees [11 am to 1:30 pm], and only 1 hour for visitors. Therefore the cafeteria is opened 1 1/2 hours longer for employee dinner, or 1 an 1/2 hours longer, or 1.5 hours longer, or 1 hour 30 minutes longer.)

Now express that answer in minutes.

(For example: The cafeteria is opened for 90 more minutes for employees and than for visitors for dinner.)

e. Compare the times the cafeteria is opened to employees and to visitors. How much longer is the cafeteria opened for employees than it is for visitors? How many different ways can you use to come up with this answer? How many different ways can you express these answers. Be creative and don't stop at just one approach.

The cafeteria is opened 90 minutes longer for employees than for visitors. Is there a way to express this in a per cent? Many ways to come up with answer: Find all times that are the same and concentrate on the differences, which is the hour and a half for dinner; determine how long the cafeteria is opened for each function, add up all of these for employees [8 hours, 15 minutes {8.25 hours}] and then for visitors [6 hours, 45 minutes {6.75}] and then subtract. Please encourage and validate other responses that are appropriate to the situation.)

THINK LIKE A TEACHER

DISCUSS: Before exploring answers to the above questions with the whole class, discuss: How does the requirement of having to explain in detail all the calculations you make on a problem (which is another way to say "show all your work") help you to learn?

(For example: It slows me down, but I find that I have to be more careful, which means I don't make careless mistakes, etc.)

Now discuss your answers to questions a through e. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point, since the reason for knowing how to do this math has been demonstrated by the exercise.)

22. Time is not only expressed in hours and minutes. It can also be expressed in terms of weeks, months, and years, as it is in the next document you will examine, the Retirement/Pension Plan of the Benefits Section of the Personnel Manual. Find this material in your Resource Manual and **skim** it. Your instructor will break the class into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions.

Each member of group should be prepared to support the group's answers with all the steps it took and the calculations it made.

a. **Using your experience from this class with using numbers and letters to organize information, how could you more effectively organize the outline structure of the various subheadings under *Eligibility* to eliminate the use of the double "A", "B", etc.**

(For example: The 1969 period should be preceded by an A and the items under it [now marked A, B, C] should be marked 1, 2, 3 respectively. The 1976 period should be preceded by a B, and the items under it [now marked A, B, C] should be marked 1, 2, 3 respectively.)

b. **Frank Graham started work with The Regional Medical Center on December 7, 1981. He was a full-time employee working 40 hours per week. When does he become a participant in the Retirement/Pension Plan?**

(For example: He would become a participant on Dec. 8, 1982 since he fits under the 1976 part of Section I "Eligibility", B which says, if work for 12 months and 1,000 hours you qualify. Working 40 hours a week times 52 weeks is a total of 2080 hours.)

c. **Sally Jones started work with The Regional Medical Center on June 20, 1984. She worked 20 hours a week. When does she become a participant in the Retirement/Pension Plan?**

(For example: Sally will be eligible on June 21, 1985 since she fits under the 1976 part of Section I "Eligibility", B which says if work for 12 months and 1,000 hours you qualify. Working 20 hours a week times 52 weeks is a total of 1040 hours. Could figure this out by dividing 2080 hours you figured for Frank by 2 since Sally worked exactly 1/2 the hours per week that Frank did. Encourage these alternative approaches!))

d. **Judy Workman started work with The Regional Medical Center on April 28, 1987. For the first six months of her employment she worked 15 hours a week. For the next 3 months, she worked 17 hours a week. Thereafter she worked 25 hours a week. When does she become a participant in the Retirement/Pension Plan?**

(For example: Judy worked a total of 390 hours for the first 6 months [15 hours x 26 weeks, or 15 added together 26 times; or 15 x 52 divided by 2, etc.), 221 hours for the next 3 months [13 weeks x 17 hours, etc.], and 325 hours for the last 3 months of that calendar year [13 weeks x 25 hours, etc.]. When you add all the totals, she only worked 936 hours. Since she did not work the 1,000 hours, she is not yet eligible on April 29, 1988. Under clause C, she will be eligible on January 1st of 1989 because she will have worked 1000 hours during 1988.)

(Make sure participants explain all of these steps and the document support for their conclusions.)

DISCUSS: **Each group will be called on in turn to answer these questions until all of them have been answered and the discussion is complete to everyone's satisfaction. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.**

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point, since the reason for knowing how to do this math has been demonstrated by the exercise.)

EXPLORE AND EXPLAIN MSDS FORMS

23. Material Safety Data Sheet (MSDS) forms are a very important part of your work. Before we investigate the way numbers are used in this material, let's learn more about the MSDS forms themselves. Find the answers to the following questions in your work area and be prepared to report back the results of your explorations to the rest of the class.

    a. What is a Material Safety Data Sheet?

(Should be interesting what the participant's suggest for this answer. For example: Documents that show how to handle the various chemicals that we use for cleaning supplies, etc.)

    b. Are there any MSDS forms located within your work area? If yes, why are they located there?

(This question and the following questions are designed to get participants curious about the forms.)

    c. If you have used an MSDS form on the job, what were the reasons and circumstances for using it?

    d. If you haven't used an MSDS form on the job, would you feel comfortable in using one if the situation demanded it? Why or why not?

    e. Make a list of all the things that you would like to know about the MSDS form? List as many as you want to.

(Encourage participants to give all the questions they really have. Take the time to help them investigate the answers to these questions, at least the ones that won't be answered by the next exercise.)

DISCUSS: Report back to the class the results of your investigation of the MSDS forms and the answers to these questions. Compare the use of MSDS forms in the different departments represented in the class. After the discussion, be prepared to explain to your classmates how you intend to use this information about the MSDS forms on the job.

Then plan with your instructor how you will go about finding answers to the questions you listed in answer to question e.

NUMBERS IN THE CONTEXT OF MSDS FORMS

Now we will explore more closely the use of numbers in one of these MSDS forms. Your investigation of MSDS forms has lead you to read some of the forms. You already know that there are a lot of numbers on these forms -- some very technical. We are going to explore all of them knowing full well that we won't know them all That's OK -- some of the numbers represent chemistry situations!

We'll examine the numbers that we do know about and raise questions about the rest. Don't forget it is the context of the MSDS forms in which the numbers are used that is important to understand, and you have started to develop that context by the investigation you did in answer to exercise 23.

24. Find the MSDS sheet for SaniMaster III in your Resource Manual. Briefly skim the material. Your instructor will divide the class into groups. Each group is to read the following questions and then more carefully read the MSDS form to answer the questions.

    a. How many different ways are numbers used to convey information in the MSDS form? Please list below each way numbers are used and the examples from the MSDS sheet.

THE WAY NUMBERS ARE USED	EXAMPLE
(Some of the major ways numbers are used:	
Organize by section numbers	Section I, etc.
telephone numbers	Emergency number
street addresses and zips	Same address found in 2 places
dates	At bottom of right hand column
time	Section 4, 15 minutes, etc.
temperature	Section III, boiling pt, IV, flash pt
show percents	Section II, 1%, 0.1%
chemical representations	Section II, & III
document numbers	CRF #, E.P.A.#, I.D. #, C.A.S. #.

(Will be interesting to see how the participants organize this. Their responses for examples should be a lot more specific than given above.)

    b. Place a check mark by each example item on your list that your group does understand the context of the numbers used and what they mean.

    c. Place a question mark beside each item on your list that the group does not understand the context of the numbers used or what the they mean.

DISCUSS: This discussion will use a different classroom procedure than we have been using. Follow the sequence of questions below.

A. Your instructor will first ask each group to contribute its list of the ways numbers were used. The class will then agree to take out duplications if any and agree on the final list. Write the revised list here. (Just write the list of the different ways numbers are used, not all the examples that go with them.)

FINAL LIST OF WAYS NUMBERS ARE USED

B. The instructor will then go through the list, one at a time, and ask for a group that placed a check mark by these examples to explain to the rest of the class what the group knows about the context of the number and what the numbers used in the examples mean.

C. Make a list of the examples on the MSDS form that were not known by any group below.

EXAMPLES OF THE USE OF NUMBERS NOT KNOWN BY THE CLASS.

25. Your instructor will assign some of the number situations that were not known to the groups to research in their text books. As you can see, some of these numbers involve chemistry and are beyond the scope of the class, so not all of the unknown numbers will be assigned for further study.

DISCUSS: Each group will makes its presentation on its assigned topic to the rest of the class for discussion and comments. If you feel you need more practice or more background information with any of the exercises presented, write down your interests below and consult with your instructor after class for some material in this area.

UNDERSTANDING THE CONTEXT OF MATH PROBLEMS

In the following exercises, you will be asked some questions about individual math problems. Most of these questions, however, don't ask you to come up with the math answers right away. The initial questions are designed to start you thinking about the math context of the problem, so that you can develop a framework for math. So read the whole math problem situation first and then answer the questions *written below* the problem. We are using this sequence because we are concentrating on the steps needed to solve math problems, not on the answers yet.

26. The directions on the label of GlassClene Pro states:

1 Part GlassClene Pro to 3 Parts Water.

How much GlassClene Pro and how much water would it take to fill a container that holds one gallon?

THINKING ABOUT MATH

a. What does the word "part(s)" mean on this label?

(For example: It's like a fraction of something. In this case, the total amount you want to make should be broken down into 4 equal measures.)

b. Is there a definite amount for something called a part?

(For example: It could be any amount as long as there is a 1 to 3 ratio maintained when mixing the GlassClene and water, like 1 gallon of GlassClene to 3 gallons of water.)

c. Can you give an example of something done in the kitchen that uses the idea of "part" as it is used in our math problem?

(For example: Sometimes recipes call for this depending on how much you want to make of a dish. OR Household cleaning products use the same wording.)

d. Can you come up with a way to solve this problem that does not directly involve math?

(For example: Take any container, fill it once with GlassClene, pour in a big container, then fill the original container 3 times with water. [Well, there is still some math in this, but not directly.])

e. How many different ways, using math, could you use to solve this problem? (Don't forget, we don't want you to solve the problem; we just want you to start thinking about solving it.)

(For example: Determine the full amount you want to make, and then divide by 4 to get the amount of a single part. OR Find the amount of one part and then multiply by 4 to get the total amount you will be making.)

f. Did the example of using "parts" in the kitchen help you to think about a solution to this problem? How?

DISCUSS: As a class, discuss the answers to the above questions. Make a list of the different ways the class suggests math can be used to solve this problem.

27. Your instructor will divide you into groups. Each group will be assigned one of the different ways to solve the problem. Please use the math texts to help answer your questions and to support your calculations and answer. Each member of each group should be prepared to relate to the rest of the class how the group went about solving the problem, an explanation of each of the steps they took, and the section of the math book that support the group's answer.

DISCUSS: Each group will present its solution to the class. The other members of the class should listen carefully so that they can ask questions if they do not understand any part of the explanation or the supporting material from the math texts. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

(For example: One quart, since it takes 4 quarts to make a gallon and 1 part to 3 parts makes four total parts.)

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point since the reason for knowing how to do this math has been demonstrated by the exercise.)

SAME SITUATION, DIFFERENT MATH

Many times in math, you would finish one problem and go directly to another, completely different one. In this book, you will explore the same problem from different standpoints. We hope that this deeper exploration of one situation will help you to place math within a relevant work context, to learn to think in the context of math, and to understand *when* to use different calculation skills, not just *how* to do them.

28. a. What does that paragraph mean to you?

b. What is the difference between knowing when to use different calculation skills and knowing how to do them?

(Some people equate knowing how to add subtract, etc. neatly arranged figures as knowing how to do math, when the important skill is knowing in a word problem or in the real world what calculation skill to use. Calculators can be used to learn how to do add, etc., only you can tell when you have to add.)

c. Is it important to know when to use a particular skill? Note your answers here.

DISCUSS: Discuss your answers to these questions with the rest of the class.

29. Here is another question which uses the same basic situation. The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

How much GlassClene Pro and how much water would it take to fill a container that holds 128 ounces?

THINKING ABOUT MATH

a. How is this problem the same as in exercise 26? How is it different?

(For example: It is the same because we are going from the whole to the part. It is the same because 128 ounces = a gallon. It is different in that in this problem you have to express your answer in ounces whereas in the other problem you could use ounces or quarts.)

b. What words in this problem make it different from the other one? How do these words affect the kind of math you do?

(For example: Ounces make the problem different. Doesn't really affect the kind of math you do since you still have to divide, but if you use quarts, you could do it in your head and not on paper.)

c. How many different kinds of math calculations can you use to solve this version of the problem?

(For example: Can divide by 4; can do a ratio and proportion [don't bring it up if no one in the class does].)

DISCUSS: Discuss your answers to these questions with the rest of the class.

30. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

SAME SITUATION, DIFFERENT MATH

31. Here's a new problem, using the same situation. The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

How much of the mixture can be made from a five gallon bottle of GlassClene Pro?

THINKING ABOUT MATH

a. How is this problem the same as in exercises 26 and 29? How is it different?

(For example: It's different because its going from the part to the whole instead of the whole to the part. Same in that it uses the same ratio of 1 to 3.)

b. What words in this problem make it different from the other two? How do these words affect the kind of math you do?

(For example: The words "how much of the mixture can be made from", which indicates it goes from the part to the whole.)

c. How many different kinds of math calculations can you use to solve this version of the problem?

(For example: Can multiply by 3; can do a ratio and proportion.)

DISCUSS: Discuss your answers to the above questions with the class. What conclusions can you make about the importance of words in math problems? How do the words in the problem relate to the form that the answer should take?

32. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. Note below any interesting points the discussion brings up.

THINK LIKE A TEACHER

33. Now its your turn to come up with a math problem that uses this same situation. This exercise will help you to see that it is in the words of the problem that the math is found. Your instructor will divide the class into groups. Each group will create one problem from the basic situation we have been dealing with. Here is how the problem will start out.

The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

Add your question to this situation. The question should be different from the ones we have used to this point. Be creative. Try to ask a problem that might come up on the job. Then solve your problem in the group and find support for your calculations in the math book.

(*For example: If you had a four gallon jug in which to mix the product, how much water and how much GlassClene Pro would you use?*)

Then your instructor will ask each group in turn to present its problem (without the answer!) to the rest of the class for them to discuss and attempt to solve. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point, since the reason for knowing how to do this math has been demonstrated by the exercise.)

THINK LIKE A LEARNER

34. After all the groups have completed their presentations and the class has solved all the problems, discuss the following questions.

a. What have you learned about math in this series of exercises which used the directions from GlassClene Pro?

(Let the participants express themselves, even if it is negative. If positive, ask them for reasons, explanations, and examples. Encourage them sharing some of the basic things they learned or how they might now look at math in a new way.)

b. What have you learned about the relationship between words and math in math situations at work?

(These exercises were designed to show that it is the words in the math context that dictate what math skills to use. Let's hope they see the reading of the problem to be as important as doing the math calculations.)

c. Was it easier to answer the problem these exercises asked or was it easier to create your own problem? In which situation did you learn the most? Why?

(Will be interesting to hear the participants' responses. Ask them to give explanations and reasons for their conclusions.)

d. Which is a better way to learn: Looking for support in the math text on a problem you have, or reading pages a teacher might assign and then doing the assigned problem? Why?

(I do hope they see that looking for their own support allows them to take control of the situation, whereas when teachers assign problems, the teachers are in control. When participants are on the job, they have to solve problems on their own; teachers aren't there to assign pages to read or suggest solutions.

NEW SITUATION, SAME MATH

35. This exercise presents a new situation. See if you can apply some of the math thinking you have just gone through to solve this problem. Just read the problem situation first and then answer the questions that follow.

How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean the tiles on the kitchen walls? The label has the following Mixing and Use Instructions.

1. Use the following guidelines to determine correct dilution:

wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

THINKING ABOUT MATH

a. What does the "/" mean in the instructions?

(For example: Means per or 1 to 3 ounces for each 1 gallon.)

b. What *words* do you have to understand to help you with this math problem?

(For example: Have to know the words in parenthesis, know what "dilution" means, know what "oz" and "gal" mean.)

c. What is different about this problem compared to the GlassClene Pro questions asked previously?

(For example: Seems like you add this cleaner to a container that already holds a specific quantity of water.)

d. Can you come up with a way to solve this problem that does not directly involve math?

(For example: Find a gallon bucket, fill it with water and measure out the necessary ounces. [Again, hope the participants come up with more ingenious solutions.)

e. How many different ways, using math, could you use to solve this problem? (Don't solve the problem yet.)

(For example: Not many different ways. If I have a five gallon container and was going to put five gallons of water in it, I would then multiply the oz by 5 to put in the correct amount.; again, could do a ratio and proportion calculation.)

DISCUSS: As a class, discuss the answers to the above questions. Make a list of the different ways the class suggests math can be used in this situation.

36. Your instructor will divide you into groups. Each group will be assigned one of the different ways to solve the problem. Please use the math texts to help answer your questions and to support your calculations and answer. Each member of each group should be prepared to relate to the rest of the class how they went about solving the problem, an explanation of each of the steps they took, and the math book sections that support the group's answer.

DISCUSS: Each group will present its solution to the class. The other members of the class should listen carefully so that they can ask questions if they do not understand any part of the explanation or the supporting material from the math texts. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point, since the reason for knowing how to do this math has been demonstrated by the exercise.)

SAME SITUATION, DIFFERENT MATH

37. Here is another problem that uses the same situation:

> How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean the lobby floor after a heavy rain storm? The label has the following Mixing and Use Instructions.
>
> **1. Use the following guidelines to determine correct dilution:**
>
wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

THINKING ABOUT MATH

a. How many ways is this problem the same as the one in exercises 26, 29, and 31?

(A comparison exercise. Allows the participants to analyze and evaluate. For example: This is more like 26 and 29 as it goes from whole to the particular; all dealing with cleaning materials.)

b. How many ways is this problem different from exercises 26, 29, and 31?

(For example: You have to know what you are cleaning to determine the correct dilution rate; don't have a general category called parts, have specific numbers in ounces and gallons; etc.)

c. How many different kinds of math calculations can you use to solve this version of the problem?

(For example: You multiply both ounces and gallons by the same figure, depending on the total volume of the container; again can use ratio and proportion. [If you get into ratio and proportion at this time, can go back and do ratio calculations with the other exercises.])

DISCUSS: Discuss your answers to these questions with the rest of the class.

38. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

(If enough of the participants have a similar math drill problem, don't hesitate to help guide the class as a whole. It's OK to give them drill and other similar word problems at this point, since the reason for knowing how to do this math has been demonstrated by the exercise.)

THINK LIKE A TEACHER

39. Now its your turn to come up with a math problem that uses this same situation. The previous exercises will help you to see that it is in the words of the problem that the math is found. Your instructor will divide the class into groups. Each group will create one problem from the basic situation we have been dealing with.

Here is how the problem will start out.

The label of FloorStar Degreaser has the following Mixing and Use Instructions.

1. Use the following guidelines to determine correct dilution:

wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

Add your question to this situation. The question has to be different from the ones we have used to this point. Be creative. Try to ask a problem that might come up on the job. Then solve your problem in the group and find support for your calculations in the math book.

Then your instructor will ask each group in turn to present its problem (without the answer!) to the rest of the class for them to discuss and attempt to solve.

WORDS AND MATH

40. Here is the final problem involving labels of some of the products that you see on your job. The product FloorStar DuoClene has the following mixing instructions:

FOR SHOWER SCRUBBING -- Mix 5 oz. of DuoClene with water to make 1 gallon; use mixture for shower scrubbing.

a. How much water will you use to make a gallon of the mixture?

(For example: Here I would have to convert gallons to ounces [128 ounces], subtract 5 oz from 128 ounces which equals 123 ounces.)

b. How would you measure to get the correct volume of water?

(For example: The hard part would be to actually measure 123 ounces of water. I might fill up a gallon container with water, and then take a measuring spoon and take out five ounces.

41. You can see how instructions in problems that look similar can make a big difference in the kind of math you do. Now you are going to compare how mixing instructions are stated and the differences these various instructions make in the kind of math you have to do. Here are the three types of instructions we have worked with.

A. **"Mix 1 part of the product to 3 parts water;"**

B. **"Mix 1-3 oz/gal;"**

C. **"Mix 5 oz. of the product to make 1 gallon of the mixture."**

Your instructor will divide the class into groups. Each group is to determine the difference between the instructions on labels that we have examined; these instructions are set forth below. Determine for each instruction:

a. How is each of these instructions different from the others?

(For example: In A, I have to determine what I consider to be a part and then multiply the product by 1 and the water by 3; in B, I have to determine how many gallons I will need and then fill the container with that number of gallons of water and then multiply the ounces by that same number; in C, I have to make exactly an even gallon or gallons of the mixture, so after determining the number of gallons I want, I have to use that number to multiply the number of ounces of the product I need and then subtract that amount from the amount of water I put in the container.)

b. What are the words and/or sentence structure that makes each set of instructions different?

(For example: A: "1 part to 3 parts;" B.: "oz/gal;" C: "ounces of product to make gallon of mixture.")

c. What kind of math is required to be done because of the way the instructions are worded.

(For example: A: determine what a part is and then multiply that part by 3 to get the water; B: determine how many gallons you want and then multiply the ounces by that number; C: determine how many gallons you want, multiply the ounces by that number and then subtract the number of ounces from the total amount of the water.)

d. Can these instructions be reworded to make them all consistent with each other? Why or why not?

(For example: Not sure they can since the total amounts of the mixture are all different.)

DISCUSS: Each group will present to the class its conclusions on one of the instructions until all groups have covered all the questions and issues. Discuss any new calculation skills that this exercise has uncovered.

42. After all the groups have completed their presentations, discuss the following questions.

a. What have you learned about math in this series of exercises?

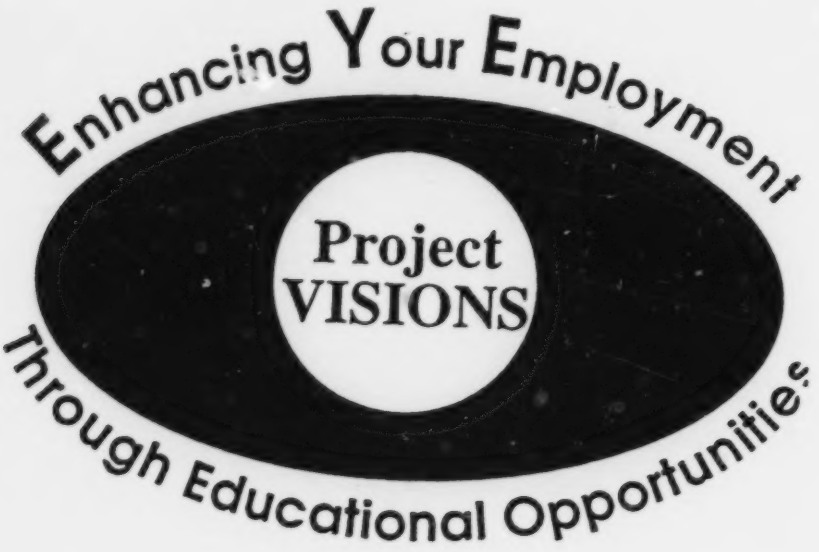
b. What have you learned about the relationship between words, math, abbreviations, and symbols?

c. Was it easier to answer the problem these exercises asked or was it easier to create your own problem? Why?

d. In which situation did you learn the most? Why?

e. Which is a better way to learn: Looking for support in the math text on a problem you have or reading pages a teacher might assign and then doing a problem? Why?

The Regional Medical Center/
Orangeburg-Calhoun Technical College



STUDENT WORKBOOK

For

The Numbers and Charts Course

Developed by Edmund Vitale, Jr.
Gaithersburg, Maryland

The Regional Medical Center
Project VISIONS
The Numbers and Charts Course

AN INTRODUCTION - WHERE YOU HAVE BEEN AND WHERE YOU ARE GOING!

We are going to take advantage of your vocabulary, dictionary, and other thinking and problem-solving skills learned in the VOCABULARY course and transfer them to help you explore numbers, math, and charts that occur on your job. You will be asked, at first, non-math questions about numbers and math situations just to get you thinking about numbers and math. Later, you will get more practice and drills in math calculations. Don't forget that one of the major objectives in these courses is to get you to THINK AND UNDERSTAND about a subject, not just do drills.

Transferring skills from one course to another and from the classroom to the work place is an important goal of this workplace project. Thinking about **transferring** skills will help you think and problem-solve within the context of work and use what you already know to help you solve new problems. So we will be continually asking you how the skills you learned in the vocabulary course can be used in a math course, and how the skills you learned in the classroom can be used on the job.

ORGANIZING INFORMATION -- CLASSIFICATION

1. One of the major skills you learned in the vocabulary course is to organize information and words in different ways. List at least two ways that you organized (or classified) the words in the vocabulary course.

2. Can numbers be used to organize information? Give an example.

3. Does the hospital use numbers to organize information? List as many ways as possible the Hospital uses numbers to organize information.

DISCUSS: Discuss with the class how both numbers and letters are useful to organize information. Talk about how numbers and letters are similar in organizing information and how they are the different. Be prepared with as many examples as possible of the use of letters and numbers to organize information. Note here any new ways to organize information that you get from the class discussion.

UNDERSTANDING NUMBER CONTEXT -- LABELING

In the vocabulary course, you did labeling and categorization exercises using words. Do you think you can do the same kind of exercises with numbers? First, we'll try using a labeling exercise with numbers. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 18 and 19 [pages 19 and 20] and reread the steps you went through to solve these labeling problems. (This is an example of using the skills you have already developed to learn about math!)

4. Here are groups of numbers and/or groups of numbers with symbols and/or words (which we will call number phrases). Determine what each group of numbers or number phrases have in common and write the most accurate label for each group on the line above. In other words, try to determine the context, the situation, in which these numbers might occur; this will give you a clue as to the label that could describe them. The very first problem is from the vocabulary course and is included as an example!

Hospital Telephone
A. Extensions
2430
2422

B. _____
1/4
1/2
3/4

C. _____
.25
.50
.75

D. _____
25%
50%
75%

E._____
12 = 1
3 = 1
100 = touchdown!

F._____
60 = 1
60 = 1
24 = day

G._____
3 East
3 West
4 West

H._____
1 oz./gal.
16 oz./gal
1 part to 3 parts

I._____
1 = 3.8
5 = 18.9
30 = 113

J._____
32
98.6
212

K._____
one-half
three-quarters
one-tenth

L._____
half dollar
three quarters
dime

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these "number" problems and the way you solved the vocabulary problems?

UNDERSTANDING CONTEXT

DISCUSS: The box that introduced these labeling exercises said: "Understanding Number Context." What do you think the "context' or "the context of the situation" has to do with solving these labeling problems?

Give an example or two from exercise 4 that indicates the context of the numbers leads to its solution.

Please take some time to think about and discuss the concept of number context because you will be (1) looking at hospital contexts and situations that involve numbers, and (2) attempting to solve the problems from a math point of view. You will viewing these problems in the way a math person would. This means math is not the only way to solve a problem, but it is one way to do so.

THINK LIKE A TEACHER

5. You are going to continue to think like a teacher, but now you are going to start to think in the context of a math teacher! Prepare 3 or 4 three number or number phrase groups like those in exercise 4 using situations from around the hospital. Your instructor will choose one or two of your number labeling groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.

THINK LIKE A LEARNER

This new series of exercises -- *Think Like A Learner* -- will help you focus on what YOU learned about thinking, learning, and transferring skills from one context to another. Don't be limited to what was specifically being taught in the classroom or in this text. Take all this material and make it relevant to YOU; and what is relevant to you may not be what is directly being taught. If something you already know "clicked" in a new way, make note of that!

6. What was the most interesting thing you learned from these exercises so far? Why is it interesting?

7. What was the most interesting thing you learned that was not directly a part of the exercise, something old that clicked in a new way? Be specific.

DISCUSS: Discuss with the rest of the class your answers to the above two questions.

UNDERSTANDING NUMBER CONTEXT -- CATEGORIZATION

Now we are going to try to do a categorization exercise with numbers instead of words. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 21 and 22 [pages 22 through 24] and reread the steps you went through to solve these categorization problems. To repeat, this is an example of using the skills you have already developed to learn about math and number context!

8. Don't forget you have to have a reason for picking the number or number phrase that doesn't fit within the context of the other numbers or phrases. You instructor will make available some math books for you to use as a resource to answer some of these problems. You may even need your dictionary for some of these problems!

A. 1/3 REASON:
.5
50%
1/2

B. decimate REASON:
quarter
multiply
divide

C. part REASON:
add
decimal
fraction

D. $.50 REASON:
$.05
$.75
$.25

E. + REASON:
--
#

F. 1/2 REASON:
5/10
1/3
8/16

G. 1 = 3.8
5 = 18.9
10 = 50
30 = 113

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these categorization "number" problems and the way you solved the categorization vocabulary problems?

THINKING ABOUT THINKING IN CONTEXT

9. Read the following statement and be prepared to discuss what you think it means.

> The thinking skills that are the same in solving the vocabulary and number categorization exercises are thinking skills that are more general and can be applied to many other contexts and situations. The thinking skills that are different means that they are related more to the context in which they arise.

10. Make a list of the "general thinking skills" that you can be used in many situations and give an example or two of other "contexts" or situations in which each general skill you listed can be used.

11. Make a list of the thinking skills that you believe are more related to the math context.

DISCUSS: With the rest of the class, discuss your interpretation of the quote in exercise 9 and your list of general thinking skills (exercise 10) and your math thinking skills (exercise 11). Place all the math thinking skills that the class developed in the space below.

THINK LIKE A TEACHER

12. Prepare 3 or 4 number or number phrase groups like those in exercise 6 using situations from around the hospital. Make one of the four numbers or words in the groups not fit with the others. Your instructor will choose one or two of your number categorization groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.

THINK LIKE A LEARNER

13. Was it easier to answer the book's categorization problems in exercise 8 or was it easier to develop your own categorization problems? Why? In which activity did you feel that you learned more? Why?

FROM NUMBERS IN CLASS TO NUMBERS AT WORK

To this point, we have explored many kinds of numbers, attempting to create a context to try to better understand the numbers. We have seen how numbers are used to organize information (floor numbers, telephone numbers, the numbers of these exercises, etc.), and we have seen how numbers convey information (fractions, percents, money, etc.). When numbers are used to organize or convey information, they are always used in conjunction with other words, symbols, or abbreviations which supply the context of numbers we have been exploring. Numbers don't mean anything without the context.

For example, if we say 55, that is a meaningless number. If, however, I say 55 mph, now we can translate the abbreviation, come up with "miles per hour", and understand that 55 mph might be a reference to a speed limit on the road.

The numbers we explored so far were number activities found in the classroom. Now, we are going to explore numbers, how they are used, and what they mean, in a very specific context: your workplace.

USING NUMBERS TO ORGANIZE AND CONVEY INFORMATION

14. The first workplace document you will explore is the Job Description for Housekeeper I found in your Resource Manual. Your instructor will divide the class into two groups. One group will circle all the numbers found on the job description that organize information and will be prepared to explain to the rest of the class how the numbers are used to organize. The other group will circle all the numbers that convey information and will be prepared to explain to the rest of the class what information is being conveyed by the numbers. If some numbers might convey information and at the same time organize information, both groups should be prepared to state how the numbers do that.

DISCUSS: Each group will makes its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

WORDS THAT REQUIRE NUMBERS IN DOCUMENTS

15. The next document you will explore is the Blue Cross Blue Shield Dental Services Claim Form, found in your Resource Manual. Your instructor will divide you into two groups. One group is to find all of the *words* on the form that require the person filling it out to insert numbers. The group should be prepared to explain what kinds of numbers are required and what they mean. The other group is to study the diagram in the middle of the page against the right hand margin, explain what the diagram represents, determine what the numbers and letters represent, and, finally, how that information is used in other places on the form. This group is also to explain the service codes on along the bottom of the page and determine where they are to be used on the form.

DISCUSS: Each group will make its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

USING NUMBERS TO ORGANIZE INFORMATION: THE CALENDAR

16. The next document you will explore is the Grievance Procedure portion of the Personnel Policy Regulations found in your Resource Manual. Skim the document briefly, circle all the numbers found in the document, and then read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. Why does the policy number change on each of the pages?

    b. Explain how numbers and letters are used to organize information in the outline form the document uses? Be prepared to explain each level of the outline and how the numbers and letters show relationships among information.

    c. Under roman numeral IV., explain the difference between "ten (10) calendar days" (as found in First Step) and "five (5) working days" (as found in First, Second, and Third Step).

DISCUSS: Share your responses with the rest of the class. Determine whether the numbers referred to in questions a, b, and c are used for organizing information or for conveying information. Note in the space below anything new you have learned during the discussion.

17. Based on the definitions that you have suggested for "calendar days" and "working days" in part IV. of the Grievance Procedure, work through the situations below and answer the questions. You will need a 1994 calendar for this task.

    a. An employee thinks he has a grievance on January 25th, 1994. Give the date of the last day he can present his concern to his immediate supervisor or department head. Be prepared to explain how you arrived at your answer.

    b. The employee has filed his grievance on January 27th. What is the latest date the supervisor or department head can render a decision? Be prepared to explain how you arrived at your answer.

    c. This matter goes all the way to Fourth Step where the Medical Center President has to write a decision. The administrative staff reached a decision on February 9, 1994. What is the latest date the Medical Center President can render his or her decision? Be prepared to explain how you arrived at your answer.

DISCUSS: Discuss your answers to these questions with the rest of the class. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

18. Calendars use numbers to organize time. As seen in the Grievance Procedure, numbers had to be translated to calendar dates to set the time limits for various stages of the Grievance Procedure Process. A calendar is one kind of chart organizing time, but it is not the only way to organize time. The Regional Medical Center has devised it's own form to organize time for the specific purpose of scheduling when employees will report to report to work and when they are off from work. This chart is called the Working Schedule, a blank copy of which is in your Resource Manual.

The instructor will divide you into groups. Using a blank Working Schedule, each group is to fill in the beginning and ending dates, the month row, the date row, and the time off of specific employees based on the information below. You will need a 1994 for this task.

> The work period runs from the third Monday in March (1994) for six full weeks. Employee Carie Smith does not work Saturdays or Sundays during this period. Francis Jones doesn't work on Fridays and works alternating Saturdays and Sundays starting the first weekend. Diane Thompson doesn't work on Mondays and works alternating Saturdays and Sundays starting the second weekend.

Concentrate on how words are used to convey information to be translated into dates (as in the Grievance Procedure exercise). Each member of the group should be prepared to defend the work of the group by being able to explain the steps used to arrive at each decision that was made and be able to support the each decision.

DISCUSS: Your instructor will call on individuals to explain each of the blanks that were required to be filled in. Other members of the group should be available to support the group member who was called on. Note below interesting approaches to the decisions that were made.

DISCUSS: Can you think of other ways to organize the Work Schedule that would make it easier to complete or easier to follow?

THINK LIKE A TEACHER

19. Bring to class similar work or inventory organizing charts used in your work or which others in your area use. Be prepared to make a presentation to the class to explain how your chart is constructed and how it uses numbers to organize or convey information. Use the space below for notes from charts you find of interest.

USING NUMBERS TO SET PRIORITIES

20. The Weekly Inspection Report uses numbers in a different way from what we have analyzed so far. Find the Weekly Inspection Report in your Resource Manual. Skim the document *briefly* and then break into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. What is the total of each of the columns of figures that are preprinted in each box? Is there any other place in the document that indicates what those totals might be?

    b. For what purpose are the numbers used in each of the four boxes?

c. Which activities in the "Entrance Lobby" is the most important? How do you know?

d. List below the activities in the "Patient Rooms" in their order of importance? Be prepared to explain how you arrived at the order of your list.

e. Out of all the activities in all four boxes, which activity do you think is the most important? How do you know?

f. Using all four boxes, list the six most important activities? How do you know?

g. Try to find a pattern in the information you obtained from exercise e and f above? Explain in specific detail the pattern you see. If your group finds more than one pattern, be prepared to explain them.

DISCUSS: Each group will be called on in turn to answer these questions until all questions have been answered and the discussion is complete to everyone's satisfaction. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

USING NUMBERS TO CONVEY INFORMATION: TIME

21. The next document we will examine from the point of view of numbers is the Cafeteria Benefits Policy found in your Resource Manual. This document uses time to convey when the cafeteria is opened for employees and visitors. Skim the one page document briefly and break into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions.

    Each group should also be prepared to explain in detail all the steps and all the calculations used to arrive at each of the answers called for.

    a. How many hours is the cafeteria available for a coffee break for employees?

       How many minutes is that?

    b. How many hours is the cafeteria available for employee breakfast?

       How many minutes is that?

       Did you have any difficulty in answering the first part of this question? Why?

    c. Expressing an answer in hours, what is the difference between the time the cafeteria is opened for dinner to employees and to visitors?

       Now express that answer in minutes.

e. Compare the times the cafeteria is opened to employees and to visitors. How much longer is the cafeteria opened for employees than it is for visitors? How many different ways can you use to come up with this answer? How many different ways can you express these answers. Be creative and don't stop at just one approach.

THINK LIKE A TEACHER

DISCUSS: Before exploring answers to the above questions with the whole class, discuss: How does the requirement of having to explain in detail all the calculations you make on a problem (which is another way to say "show all your work") help you to learn?

Now discuss your answers to questions a through e. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

22. Time is not only expressed in hours and minutes. It can also be expressed in terms of weeks, months, and years, as it is in the next document you will examine, the Retirement/Pension Plan of the Benefits Section of the Personnel Manual. Find this material in your Resource Manual and **skim** it. Your instructor will break the class into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions.

Each member of group should be prepared to support the group's answers with all the steps it took and the calculations it made.

a. Using your experience from this class with using numbers and letters to organize information, how could you more effectively organize the outline structure of the various subheadings under *Eligibility* to eliminate the use of the double "A", "B", etc.

b. Frank Graham started work with The Regional Medical Center on December 7, 1981. He was a full-time employee working 40 hours per week. When does he become a participant in the Retirement/Pension Plan?

c. Sally Jones started work with The Regional Medical Center on June 20, 1984. She worked 20 hours a week. When does she become a participant in the Retirement/Pension Plan?

d. Judy Workman started work with The Regional Medical Center on April 28, 1987. For the first six months of her employment she worked 15 hours a week. For the next 3 months, she worked 17 hours a week. Thereafter she worked 25 hours a week. When does she become a participant in the Retirement/Pension Plan?

DISCUSS: Each group will be called on in turn to answer these questions until all of them have been answered and the discussion is complete to everyone's satisfaction. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

EXPLORE AND EXPLAIN MSDS FORMS

23. Material Safety Data Sheet (MSDS) forms are a very important part of your work. Before we investigate the way numbers are used in this material, let's learn more about the MSDS forms themselves. Find the answers to the following questions in your work area and be prepared to report back the results of your explorations to the rest of the class.

    a. What is a Material Safety Data Sheet?

    b. Are there any MSDS forms located within your work area? If yes, why are they located there?

    c. If you have used an MSDS form on the job, what were the reasons and circumstances for using it?

    d. If you haven't used an MSDS form on the job, would you feel comfortable in using one if the situation demanded it? Why or why not?

    e. Make a list of all the things that you would like to know about the MSDS form? List as many as you want to.

DISCUSS: Report back to the class the results of your investigation of the MSDS forms and the answers to these questions. Compare the use of MSDS forms in the different departments represented in the class. After the discussion, be prepared to explain to your classmates how you intend to use this information about the MSDS forms on the job.

Then plan with your instructor how you will go about finding answers to the questions you listed in answer to question e.

NUMBERS IN THE CONTEXT OF MSDS FORMS

Now we will explore more closely the use of numbers in one of these MSDS forms. Your investigation of MSDS forms has lead you to read some of the forms. You already know that there are a lot of numbers on these forms -- some very technical. We are going to explore all of them knowing full well that we won't know them all That's OK -- some of the numbers represent chemistry situations!

We'll examine the numbers that we do know about and raise questions about the rest. Don't forget it is the context of the MSDS forms in which the numbers are used that is important to understand, and you have started to develop that context by the investigation you did in answer to exercise 23.

24. Find the MSDS sheet for SaniMaster III in your Resource Manual. Briefly skim the material. Your instructor will divide the class into groups. Each group is to read the following questions and then more carefully read the MSDS form to answer the questions.

    a. How many different ways are numbers used to convey information in the MSDS form? Please list below each way numbers are used and the examples from the MSDS sheet.

THE WAY NUMBERS ARE USED	EXAMPLE

    b. Place a check mark by each example item on your list that your group does understand the context of the numbers used and what they mean.

    c. Place a question mark beside each item on your list that the group does not understand the context of the numbers used or what the they mean.

DISCUSS: This discussion will use a different classroom procedure than we have been using. Follow the sequence of questions below.

A. Your instructor will first ask each group to contribute its list of the ways numbers were used. The class will then agree to take out duplications if any and agree on the final list. Write the revised list here. (Just write the list of the different ways numbers are used, not all the examples that go with them.)

FINAL LIST OF WAYS NUMBERS ARE USED

B. The instructor will then go through the list, one at a time, and ask for a group that placed a check mark by these examples to explain to the rest of the class what the group knows about the context of the number and what the numbers used in the examples mean.

C. Make a list of the examples on the MSDS form that were not known by any group below.

EXAMPLES OF THE USE OF NUMBERS NOT KNOWN BY THE CLASS.

25. Your instructor will assign some of the number situations that were not known to the groups to research in their text books. As you can see, some of these numbers involve chemistry and are beyond the scope of the class, so not all of the unknown numbers will be assigned for further study.

DISCUSS: Each group will makes its presentation on its assigned topic to the rest of the class for discussion and comments. If you feel you need more practice or more background information with any of the exercises presented, write down your interests below and consult with your instructor after class for some material in this area.

UNDERSTANDING THE CONTEXT OF MATH PROBLEMS

In the following exercises, you will be asked some questions about individual math problems. Most of these questions, however, don't ask you to come up with the math answers right away. The initial questions are designed to start you thinking about the math context of the problem, so that you can develop a framework for math. So read the whole math problem situation first and then answer the questions *written below* the problem. We are using this sequence because we are concentrating on the steps needed to solve math problems, not on the answers yet.

26. The directions on the label of GlassClene Pro states:

1 Part GlassClene Pro to 3 Parts Water.

How much GlassClene Pro and how much water would it take to fill a container that holds one gallon?

THINKING ABOUT MATH

a. What does the word "part(s)" mean on this label?

b. Is there a definite amount for something called a part?

c. Can you give an example of something done in the kitchen that uses the idea of "part" as it is used in our math problem?

d. Can you come up with a way to solve this problem that does not directly involve math?

e. How many different ways, using math, could you use to solve this problem? (Don't forget, we don't want you to solve the problem; we just want you to start thinking about solving it.)

f. Did the example of using "parts" in the kitchen help you to think about a solution to this problem? How?

DISCUSS: As a class, discuss the answers to the above questions. Make a list of the different ways the class suggests math can be used to solve this problem.

27. Your instructor will divide you into groups. Each group will be assigned one of the different ways to solve the problem. Please use the math texts to help answer your questions and to support your calculations and answer. Each member of each group should be prepared to relate to the rest of the class how the group went about solving the problem, an explanation of each of the steps they took, and the section of the math book that support the group's answer.

DISCUSS: Each group will present its solution to the class. The other members of the class should listen carefully so that they can ask questions if they do not understand any part of the explanation or the supporting material from the math texts. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

SAME SITUATION, DIFFERENT MATH

Many times in math, you would finish one problem and go directly to another, completely different one. In this book, you will explore the same problem from different standpoints. We hope that this deeper exploration of one situation will help you to place math within a relevant work context, to learn to think in the context of math, and to understand *when* to use different calculation skills, not just *how* to do them.

28. a. What does that paragraph mean to you?

b. What is the difference between knowing when to use different calculation skills and knowing how to do them?

c. Is it important to know when to use a particular skill? Note your answers here.

DISCUSS: Discuss your answers to these questions with the rest of the class.

29. Here is another question which uses the same basic situation. The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

How much GlassClene Pro and how much water would it take to fill a container that holds 128 ounces?

THINKING ABOUT MATH

a. How is this problem the same as in exercise 26? How is it different?

b. What words in this problem make it different from the other one? How do these words affect the kind of math you do?

c. How many different kinds of math calculations can you use to solve this version of the problem?

DISCUSS: Discuss your answers to these questions with the rest of the class.

30. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

SAME SITUATION, DIFFERENT MATH

31. Here's a new problem, using the same situation. The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

How much of the mixture can be made from a five gallon bottle of GlassClene Pro?

THINKING ABOUT MATH

a. How is this problem the same as in exercises 26 and 29? How is it different?

b. What words in this problem make it different from the other two? How do these words affect the kind of math you do?

c. How many different kinds of math calculations can you use to solve this version of the problem?

DISCUSS: Discuss your answers to the above questions with the class. What conclusions can you make about the importance of words in math problems? How do the words in the problem relate to the form that the answer should take?

32. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. Note below any interesting points the discussion brings up.

THINK LIKE A TEACHER

33. Now its your turn to come up with a math problem that uses this same situation. This exercise will help you to see that it is in the words of the problem that the math is found. Your instructor will divide the class into groups. Each group will create one problem from the basic situation we have been dealing with. Here is how the problem will start out.

The directions on the label of GlassClene Pro states:

1 Part GlassClene to 3 Parts Water.

Add your question to this situation. The question should be different from the ones we have used to this point. Be creative. Try to ask a problem that might come up on the job. Then solve your problem in the group and find support for your calculations in the math book.

Then your instructor will ask each group in turn to present its problem (without the answer!) to the rest of the class for them to discuss and attempt to solve. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

THINK LIKE A LEARNER

34. After all the groups have completed their presentations and the class has solved all the problems, discuss the following questions.

a. What have you learned about math in this series of exercises which used the directions from GlassClene Pro?

b. What have you learned about the relationship between words and math in math situations at work?

c. Was it easier to answer the problem these exercises asked or was it easier to create your own problem? In which situation did you learn the most? Why?

d. Which is a better way to learn: Looking for support in the math text on a problem you have, or reading pages a teacher might assign and then doing the assigned problem? Why?

NEW SITUATION, SAME MATH

35. This exercise presents a new situation. See if you can apply some of the math thinking you have just gone through to solve this problem. Just read the problem situation first and then answer the questions that follow.

How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean the tiles on the kitchen walls? The label has the following Mixing and Use Instructions.

1. Use the following guidelines to determine correct dilution:

wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

THINKING ABOUT MATH

a. What does the "/" mean in the instructions?

b. What *words* do you have to understand to help you with this math problem?

c. What is different about this problem compared to the GlassClene Pro questions asked previously?

d. Can you come up with a way to solve this problem that does not directly involve math?

e. How many different ways, using math, could you use to solve this problem? (Don't solve the problem yet.)

DISCUSS: As a class, discuss the answers to the above questions. Make a list of the different ways the class suggests math can be used in this situation.

36. Your instructor will divide you into groups. Each group will be assigned one of the different ways to solve the problem. Please use the math texts to help answer your questions and to support your calculations and answer. Each member of each group should be prepared to relate to the rest of the class how they went about solving the problem, an explanation of each of the steps they took, and the math book sections that support the group's answer.

DISCUSS: Each group will present its solution to the class. The other members of the class should listen carefully so that they can ask questions if they do not understand any part of the explanation or the supporting material from the math texts. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

SAME SITUATION, DIFFERENT MATH

37. Here is another problem that uses the same situation:

> How much FloorStar Degreaser and how much water should you use to fill your gallon bucket and clean the lobby floor after a heavy rain storm? The label has the following Mixing and Use Instructions.
>
> **1. Use the following guidelines to determine correct dilution:**
>
wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

THINKING ABOUT MATH

a. How many ways is this problem the same as the one in exercises 26, 29, and 31?

b. How many ways is this problem different from exercises 26, 29, and 31?

c. How many different kinds of math calculations can you use to solve this version of the problem?

DISCUSS: Discuss your answers to these questions with the rest of the class.

38. Break into groups and each group solve the problem. Use the math books to support your answers. Report back to the rest of the class on (1) your answer, (2) all the math steps you took to come up with your answer, and (3) the support you found in the math books for your work. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

THINK LIKE A TEACHER

39. Now its your turn to come up with a math problem that uses these same instructions. The previous exercises will help you to see that it is in the words of the problem that the math is found. Your instructor will divide the class into groups. Each group will create one problem from the basic situation we have been dealing with.

Here is how the problem will start out.

> The label of FloorStar Degreaser has the following Mixing and Use Instructions.
>
> **1. Use the following guidelines to determine correct dilution:**
>
wall (painted and ceramic)	**1-3 oz/gal**
floors (resilient and mineral) -- light soil	**2-4 oz/gal**
floors (mineral) -- heavy soil	**30-40 oz/gal**

Add your question to this situation. The question has to be different from the ones we have used to this point. Be creative. Try to ask a problem that might come up on the job. Then solve your problem in the group and find support for your calculations in the math book.

Then your instructor will ask each group in turn to present its problem (without the answer!) to the rest of the class for them to discuss and attempt to solve.

WORDS AND MATH

40. Here is the final problem involving labels of some of the products that you see on your job. This exercise will be a little different from the others even though it starts out the same. The product FloorStar DuoClene has the following mixing instructions:

FOR SHOWER SCRUBBING -- Mix 5 oz. of DuoClene with water to make 1 gallon; use mixture for shower scrubbing.

a. How much water will you use to make a gallon of the mixture?

b. How would you measure to get the correct volume of water?

41. You can see how instructions in problems that look similar can make a big difference in the kind of math you do. Now you are going to compare how mixing instructions are stated and the differences these various instructions make in the kind of math you have to do. Here are the three types of instructions we have worked with.

A. "Mix 1 part of the product to 3 parts water;"

B. "Mix 1-3 oz/gal;"

C. "Mix 5 oz. of the product to make 1 gallon of the mixture."

Your instructor will divide the class into groups. Answer the following questions for instructions A, B, and C above.

a. How is each of these instructions different from the others?

b. What are the words and/or sentence structure that makes each set of instructions different?

c. What kind of math is required to be done because of the way the instructions are worded.

d. Can these instructions be reworded to make them all consistent with each other? Why or why not?

DISCUSS: Each group will present to the class its conclusions on one of the instructions until all groups have covered all the questions and issues. Discuss any new calculation skills that this exercise has uncovered.

11 After all the groups have completed their presentations, discuss the following questions.

a. What have you learned about math in this series of exercises?

b. What have you learned about the relationship between words, math, abbreviations, and symbols?

c. Was it easier to answer the problem these exercises asked or was it easier to create your own problem? Why?

d. In which situation did you learn the most? Why?

e. Which is a better way to learn: Looking for support in the math text on a problem you have or reading pages a teacher might assign and then doing a problem? Why?

The Regional Medical Center/
Orangeburg-Calhoun Technical College

The Numbers and Charts Course
Answer Key
Student's Workbook

Developed by Edmund Vitale, Jr.
Gaithersburg, Maryland

The Regional Medical Center
Project VISIONS
The Numbers and Charts Course

AN INTRODUCTION - WHERE YOU HAVE BEEN AND WHERE YOU ARE GOING!

We are going to take advantage of your vocabulary, dictionary, and other thinking and problem-solving skills learned in the VOCABULARY course and transfer them to help you explore numbers, math, and charts that occur on your job. You will be asked, at first, non-math questions about number and math situations just to get you thinking about numbers and math. Later, you will get more practice and drills in math problems. Don't forget that one of the major objectives in these courses is to get you to THINK AND UNDERSTAND about the subject, not just do drills.

Transferring skills from one course to another and from the classroom to the work place is a major goal of this workplace project. Thinking about **transferring** skills will help you think and problem-solve within the context of work and use what you already know to help you solve new problems. So we will be continually asking you how the skills you learned in the vocabulary course can be used in a math course and how the skills you learned in the classroom can be used on the job.

ORGANIZING INFORMATION -- CLASSIFICATION

1. One of the major skills you learned in the vocabulary course is to organize information and words in different ways. List at least two ways that you organized (or classified) the words in the vocabulary course.

(For example: alphabetizing; Classifying words according to where they were used in the hospital.)

2. Can numbers be used to organize information? Give an example.

(Yes. For example, phone numbers help use know who to call. They organize households by numbers and not by name, even though the phone book has to list the names that are associated with the numbers.)

3. Does the hospital use numbers to organize information? List as many ways as possible the Hospital uses numbers to organize information.

(Yes. For example: Floor numbers, patient rooms.)

DISCUSS: Discuss with the class how both numbers and letters are useful to organize information. Talk about how numbers and letters are similar in organizing information and how they are the different. Be prepared with as many examples of the use of letters and numbers to organize information as possible. Note here any new ways to organize information that you get from the class discussion.

UNDERSTANDING NUMBER CONTEXT -- LABELING

In the vocabulary course, you did labeling and categorization exercises using words. Do you think you can do the same kind of exercises with numbers? First, we'll try using a labeling exercise with numbers. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 18 and 19 [pages 19 and 20] and reread the steps you went through to solve these labeling problems. (This is an example of using the skills you have already developed to learn about math!)

4. Here are groups of numbers and/or groups of numbers with symbols and/or words (which we will call number phrases). Determine what each group of numbers or number phrases have in common and write the most accurate label for each group on the line above. In other words, try to determine the context, the situation, in which these numbers might occur; this will give you a clue as to the label that could describe them. The very first problem is from the vocabulary course and is included as an example!

(Use these exercises as ways of uncovering areas that participants want more help with; if they want some more drill or practice with anything raised by these exercises, follow through with it.)

Hospital Telephone
A. Extensions
2430
2422

Fractions or
B. Ruler marks
1/4
1/2
3/4

Decimal equivalents of Fractions in B, or
C. Decimals
.25
.50
.75

Percent equivalents of Fractions & Decimals in B & C, or
D. Percents
25%
50%
75%

E. Inches to feet to yards
12 = 1
3 = 1
100 = touchdown!

F. Seconds to minutes to days
60 = 1
60 = 1
24 = day

G. Locations in Hospital
3 East
3 West
4 West

H. Mixture rates on labels
1 oz./gal.
16 oz./gal
1 part to 3 parts

Gallon to liter equivalents
I. found on labels
1 = 3.8
5 = 18.9
30 = 113

Degrees or
J. Fahrenheit Temperature
32
98.6
212

K. Written Fractions
one-half
three-quarters
one-tenth

Money equivalent of
L. written factions
half dollar
three quarters
dime

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these "number" problems and the way you solved the vocabulary problems.

(For example: Might not be any difference with the general thinking skills. With the specific skills, can't use a dictionary too often with math, etc.)

UNDERSTANDING CONTEXT

DISCUSS: The box that introduced these labeling exercises said: "Understanding Number Context." What does "context' or "the context of the situation" have to do with solving these labeling problems?

(Have to know what situation the numbers are being used in to make sense of the numbers. If you don't know the situation, then the numbers don't make much sense.)

Give an example or two from exercise 4 that indicates the context of the numbers leads to its solution.

(For example: A [inches to feet to yards] and G [wings of the hospital].)

DISCUSS: Please take some time to think about and discuss the concept of number context because you will be (1) looking at hospital contexts and situations that involve numbers, and (2) attempting to solve the problems from a math point of view. You will viewing these problems in the way a math person would. This means math is not the only way to solve a problem, but that it is one way to do so and we will learn more about the "math context" way to solve the problems in this class.

(For example: Haven't thought too much about math context, only multiplication tables and calculation skills. This way doesn't help me with those skills... This method does help me to think about numbers in a new way that I can make sense of.)

THINK LIKE A TEACHER

5. You are going to continue to think like a teacher, but now you are going to start to think in the context of a math teacher! Prepare 3 or 4 three number or number phrase groups like those in exercise 4 using situations from around the hospital. Your instructor will choose one or two of your number labeling groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.

THINK LIKE A LEARNER

This new series of exercises -- Think Like A Learner -- will help you focus on what YOU learned about thinking, learning, and transferring skills from one context to another. Don't be limited to what was specifically being taught in the classroom or in this text. Take all this material and make it relevant to YOU; and what is relevant to you may not be what is directly being taught. If something you already know "clicked" in a new way, make note of that!

6. What was the most interesting thing you learned from these exercises so far?

(Encourage answers that are relevant to the participants, not necessarily the course. Try to show the participants that what they think about the course and what they are learning are important even if what they are learning is not just the "objective" of the lesson.)

7. What was the most interesting thing you learned that was not directly a part of the exercise, something old that clicked in a new way?

(Again, encourage a wide variety of answers. The participants have to feel comfortable with being able to express themselves on their issues. This helps set the atmosphere where "mistakes and wrong answers" are learning opportunities, not examples of failing in school.)

DISCUSS: Discuss with the rest of the class your answers to the above two questions.

UNDERSTANDING NUMBER CONTEXT -- CATEGORIZATION

Now we are going to try to do a categorization exercise with numbers instead of words. If you want to refresh your recollection about how you went about analyzing this kind of exercise, go back to your Vocabulary Course workbook at exercises 21 and 22 [pages 22 through 24] and reread the steps you went through to solve these categorization problems. To repeat, this is an example of using the skills you have already developed to learn about math and number context!

8. Don't forget you have to have a reason for picking the number or number phrase that doesn't fit within the context of the other numbers or phrases. You instructor will make available some math books for you to use as a resource to answer some of these problems. You may even need your dictionary for some of these problems!

(Use these exercises as ways of uncovering areas that participants want more help with; if they want some more drill or practice with anything raised by these exercises, follow through with it.)

A. 1/3
.5
50%
1/2

REASON: (For example: .5, 50%, and 1/2 all represent the same amount. 1/3 does not and should therefore be crossed off.) (Have students give other fraction, percent and decimal equivalents if they can. Don't press it if this is too hard.)

B. decimate
quarter
multiply
divide

REASON: (For example: decimate, quarter, and divide are all examples of taking apart or reducing or dividing, Multiply means to increase.)
(Have students put these words and other math word in their Personal Handbook. Helps to relate math in part to vocabulary building and helps build math context.)

C. part
add
decimal
fraction

REASON: (Add, to increase, is out because all the other words relate to parts of things.)
(Have students think of similar math words and add them to their vocabulary list.)

D. $.50
$.05
$.75
$.25

REASON: ($.75 should be crossed out because the other amounts are each represented by a specific coin.)
(Have participants try to understand that our money system is a decimal system. If they know money, they know decimals.)

E. +
--
#
⌐¯¯¯

REASON: (The # sign should be crossed out since it is not a math function sign like the rest of the symbols.)
(Ask if the participants know other math symbols. Could also add these symbols to their Personal Handbook.)

F. 1/2
5/10
1/3
8/16

REASON: (1/3 should be crossed out since the other fractions are fractions equivalents.)
(Use this question as an opportunity to teach about fraction equivalents. Ask them for how they think they can make fraction equivalents.)

G. 1 = 3.8
5 = 18.9
10 = 50
30 = 113

REASON: (These are the gallon/liter equivalencies which are on cleaning labels. 10 = 50 is not a proper equivalency.)
(Ask participants how you do these; how they are related to fraction equivalencies.)

PROCESS YOUR PROBLEM-SOLVING SKILLS

DISCUSS: What was the same and what was different about the way you went about solving these categorization "number" problems and the way you solved the categorization vocabulary problems?

(For example: Again, no dictionary; but since I have done the exercise with words, it helped me to do it for the math exercise.

THINKING ABOUT THINKING IN CONTEXT

9. Read the following statement and be prepared to discuss what you think it means.

> The thinking skills that are the same in solving the vocabulary and number categorization exercises are thinking skills that are more general and can be applied to many other contexts and situations. The thinking skills that are different means that they are related more to the context in which they arise.

(For example: The more useful a thinking skill is in many situations, the more general it is. Math seems to have a lot of skills that are related to math exclusively.)

10. Make a list of the "general thinking skills" that you can be used in many situations and give an example or two other "contexts" or situations in which each general skill you list can be used.

(For example: Skills of comparing, using resources, finding contexts, looking for relationships are all general skills. These can be used in finding and using information from recipe books to computer manuals.)

11. Make a list of the thinking skills that you believe are more related to the math context.

(For example; comparing numbers, trying to understand the abbreviations associated with math contexts, trying to understand the math context of words , etc.)

DISCUSS: With the rest of the class, discuss your interpretation of the quote in exercise 9 and your list of general (exercise 10) and your math thinking skills (exercise 11). Place all the math thinking skills that the class developed in the space below.

(For example: In addition to the skills participants may come up with above, can encourage them to say that adding, subtracting, dividing, and multiplying are math thinking skills. Need to know how to do those calculations to be able to think like a mathematician.)

THINK LIKE A TEACHER

12. Prepare 3 or 4 number or number phrase groups like those in exercise 6 using situations from around the hospital. Make one of the four numbers or words in the groups not fit with the others. Your instructor will choose one or two of your number categorization groups and ask you to place them on the board (without the answer!) and to conduct class on your word group. Note here points that you want to remember from other classmates' word groups.

(Pick from each learner the groupings that are correct and/or show ingenuity in viewing the math terms picked. Try to hold private conversations about the ones that are obviously incorrect. Use these incorrect ones to suggest help to the individual student.)

THINK LIKE A LEARNER

13. Was it easier to answer the book's categorization problems in exercise 8 or was it easier to develop your own categorization problems? Why? Doing which activity did you feel that you learned more?

(Make sure students always give reasons for their answers, or can support them in some way.)

FROM NUMBERS IN CLASS TO NUMBERS AT WORK

To this point, we have explored many kinds of numbers, attempting to create a context to try to better understand the numbers. We have seen how numbers are used to organize information (floor numbers, telephone numbers, the numbers of these exercises, etc.), and we have seen how numbers convey information (fractions, percents, money, etc.). When numbers are used to organize or convey information, they are always used in conjunction with other words, symbols, or abbreviations which supply the context of numbers we have been exploring. Numbers don't mean anything without the context.

For example, if we say 55, that is a meaningless number. If, however, I say 55 mph, now we can translate the abbreviation, come up with "miles per hour", and understand that 55 mph might be a reference to a speed limit on the road.

The numbers we explored so far were number activities found in the classroom. Now, we are going to explore numbers, how they are used, and what they mean, in a very specific context: your workplace.

USING NUMBERS TO ORGANIZE AND CONVEY INFORMATION

14. The first workplace document you will explore is the Job Description for Housekeeper I found in your Resource Manual. Your instructor will divide the class into two groups. One group will circle all the numbers found on the job description that organize information and will be prepared to explain to the rest of the class how the numbers are used to organize. The other group will circle all the numbers that convey information and will be prepared to explain to the rest of the class what information is being conveyed by the numbers. If some numbers might convey information and at the same time organize information, both groups should be prepared to state how the numbers do that.

(Besides some of the obvious numbers, don't let students forget the street address and the zip code in the address at the top, the dates when written and revised on top of the first page, or the dates when the documents were approved on the last page.)

DISCUSS: Each group will makes its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

WORDS THAT REQUIRE NUMBERS IN DOCUMENTS

15. The next document you will explore is the Blue Cross Blue Shield Dental Services Claim Form, found in your Resource Manual. Your instructor will divide you into two groups. One group is to find all of the *words* on the form that require the person filling it out to insert numbers. The group should be prepared to explain what kinds of numbers are required and what they mean. The other group is to study the diagram in the middle of the page against the right hand margin, explain what the diagram represents, determine what the numbers and letters represent, and, finally, how that information is used in other places on the form. This group is also to explain the service codes on along the bottom of the page and determine where they are to be used on the form.

DISCUSS: Each group will make its presentation to the class and be prepared to answer classmate's questions. Note in the space below anything new you have learned during the presentation or discussion.

(There's a lot of information here. It is not a matter of having them get all the numbers and words requiring numbers here but to give them exercise in looking at documents from this perspective. Some of the important numbers are the ones that are in each answer block; some of the important words requiring numbers are the ones in blocks 4, 8, 11 [SS#], 17. Can discuss if you think they are ready all the numbers [in the blocks at the bottom of the page] the dentist has to be concerned with.)

USING NUMBERS TO ORGANIZE INFORMATION: THE CALENDAR

16. The next document your will explore is the Grievance Procedure portion of the Personnel Policy Regulations found in your Resource Manual. Skim the document briefly, circle all the numbers found in the document, and then read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. Why does the policy number change on each of the pages?

(Let students make attempts at these answers first before guiding them to the answer. For example: Because the numbers after the decimal indicate the page number.)

    b. Explain how numbers and letters are used to organize information in the outline form the document uses? Be prepared to explain each level of the outline and how the numbers and letters show relationships among information.

(This question is getting the students to see how combinations of numbers and letters can be used precisely to organize information and show relationships.)

    c. Under roman numeral IV., explain the difference between "ten (10) calendar days" (as found in First Step) and "five (5) working days" (as found in First, Second, and Third Step).

(This is a "legalistic" type question, but it is something found in many documents including warranties. It might be interesting to hear the responses to the five working days answers by participants who work on weekends.)

DISCUSS: Share your responses with the rest of the class. Determine whether the numbers referred to in questions a, b, and c are used for organizing information or for conveying information. Note in the space below anything new you have learned during the discussion.

(a--organizing information, the page numbers; b--of course is organize; c--is conveying information, the time limitations.)

17. Based on the definitions that you have suggested for "calendar days" and "working days" in part IV. of the Grievance Procedure, work through the situations below and answer the questions. You will need a 1994 calendar for this task.

    a. An employee thinks he has a grievance on January 25th, 1994. Give the date of the last day he can present his concern to his immediate supervisor or department head. Be prepared to explain how you arrived at your answer.

(For example: This part of the problem deals with calendar days. On the calendar, I found the 25th of Jan. I started counting from the next day until I counted 10 days. When I reached 10, the date is February 4, 1994, the last day the employee can present his grievance.)

    b. The employee has filed his grievance on January 27th. What is the latest date the supervisor or department head can render a decision? Be prepared to explain how you arrived at your answer.

(For example: This part of the problem deals with working days. On the calendar I found January 27th. That day is on a Thursday. The next day is a Friday which is a working day and so I started counting from Friday. I then skipped to Monday since that is the next working day and that is day 2. I continued to count until I got to 5, I found five working days after January 27th to be Thursday, February 3, 1994.)

    c. This matter goes all the way to Fourth Step where the Medical Center President has to write a decision. The administrative staff reached a decision on February 9, 1994. What is the latest date the Medical Center President can render his or her decision? Be prepared to explain how you arrived at your answer.

(For example: This part of the problem doesn't use the terms calendar days or working days. So I will have to assume it means calendar days. February 9 is on a Wednesday. Starting with the 10th, I will count five days. The decision would have to be given by February 14th if five calendar days is meant. If five working days is meant, then the date may be February 16th.)

DISCUSS: Discuss your answers to these questions with the rest of the class. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

18. Calendars use numbers to organize time. As seen in the Grievance Procedure, numbers had to be translated to calendar dates to set the time limits for various stages of the Grievance Procedure Process. A calendar is one kind of chart organizing time, but it is not the only way to organize time. The Regional Medical Center has devised it's own form to organize time for the specific purpose of scheduling when employees will report to report to work and when they are off from work. This chart is called the Working Schedule, a blank copy of which is in your Resource Manual.

The instructor will divide you into groups. Using a blank Working Schedule, each group is to fill in the beginning and ending dates, the month row, the date row, and the time off of specific employees based on the information below. You will need a 1994 for this task.

> The work period runs from the third Monday in March (1994) for six full weeks. Employee Carie Smith does not work Saturdays or Sundays during this period. Francis Jones doesn't work on Fridays and works alternating Saturdays and Sundays starting the first weekend. Diane Thompson doesn't work on Mondays and works alternating Saturdays and Sundays starting the second weekend.

Concentrate on how words are used to convey information to be translated into dates (as in the Grievance Procedure exercise). Each member of the group should be prepared to defend the work of the group by being able to explain the steps used to arrive at each decision that was made and be able to support the each decision.

(I don't have a blank one to fill in, but I took the situations from the ones you had copied for me. If there are any problems, call.)

DISCUSS: Your instructor will call on individuals to explain each of the blanks that were required to be filled in. Other members of the group should be available to support the group member who was called on. Note below interesting approaches to the decisions that were made.

DISCUSS: Can you think of other ways to organize the Work Schedule that would make it easier to complete or easier to follow?

THINK LIKE A TEACHER

19. Bring to class similar work or inventory organizing charts used in your work or which others in your area use. Be prepared to make a presentation to the class to explain how your chart is constructed and how it uses numbers to organize or convey information. Use the space below for notes from charts you find of interest.

USING NUMBERS TO SET PRIORITIES

20. The Weekly Inspection Report uses numbers in a different way from what we have analyzed so far. Find the Weekly Inspection Report in your Resource Manual. Skim the document *briefly* and then break into groups. Each group should read the following questions and then go back to the document and study it more carefully in order to answer these questions:

    a. What is the total of each of the columns of figures that are preprinted in each box? Is there any other place in the document that indicates what those totals might be?

(For example: 100. On the back of the document [or the second page if photocopied], it shows that 100 is a possible score for each of the areas mentioned on the front.)

    b. For what purpose are the numbers used in each of the four boxes?

(For example: These scores are the top scores a worker could get for the inspection of each of the items listed. If my work isn't perfect, it would receive points lower than the maximum amount shown for that particular task.)

c. Which activities in the "Entrance Lobby" is the most important? How do you know?

(For example: The most important activities seem to be finishing the floor with a deep shine, clean public rest rooms, corners and baseboards clean. These 3 items have the highest possible points so i figured they must be the most important.

d. List below the activities in the "Patient Rooms" in their order of importance? Be prepared to explain how you arrived at the order of your list.

(For example: The item numbers of the activities of in the Patient Rooms in order of importance are: item 8 with a score of 14, items 7 & 10 tied with a score of 12, items 1, 2, 5, & 9 with a score of 10, items 4 & 6 tied with a score of 8, and item 3 with a score of 6.)

e. Out of all the activities in all four boxes, which activity do you think is the most important? How do you know?

(For example: The most important item seems to be Corridors, item 1: "Corridors finished with a deep shine". It is the only item that has a possible score of 20 points.)

f. Using all four boxes, list the six most important activities? How do you know?

(For example: The six most important items are: Corridors, item 1 (20 Points), Entrance, Lobby, items 6 and 8 (15 points), item 7 (14 points), Patient Rooms, item 8 (14 points), and Departments and Offices, item 9 (14 points).

g. Try to find a pattern in the information you obtained from exercise e and f above? Explain in specific detail the pattern you see. If your group finds more than one pattern, be prepared to explain them.

(For example: Seems that the public areas, especially the floors, are the most important.)

DISCUSS: Each group will be called on in turn to answer these questions until all questions have been answered and the discussion is complete to everyone's satisfaction. If you feel you need more practice with this kind of exercise, note below the calculation steps that you want to practice and consult with your instructor after class for some drill material in this area.

The Regional Medical Center/
Orangeburg-Calhoun Technical College

RESOURCE MANUAL

For

The Numbers and Charts Course

Developed by Edmund Vitale, Jr.
Gaithersburg, Maryland

WRITTEN: 02/19/88
REVISED: 02/12/91

THE REGIONAL MEDICAL CENTER
3000 ST. MATTHEWS ROAD
ORANGEBURG, S.C. 29115

JOB TITLE:HOUSEKEEPER I JOB GRADE:S2
CLASSIFICATION:Nonexempt POSITION CODE: 2005
DEPARTMENT:ENVIRONMENTAL SERVICES POSITION SUPV:Environ.Svc Supervisor

I. Job Summary:

Clean patient rooms, offices and ancillary areas daily. Clean and make beds when patients are discharged. Take care of housekeeping problems as requested, i.e. spills, etc...

II. Job Relationships:

A. Responsible to: director of environmental services
B. Assignments received from: supervisor, assistant director and director.
C. Nature of supervision received: immediate supervision from environmental service supervisor.
D. Position supervised and nature of supervision given: none.
E. Interactions with: interaction is required with every department, but the most frequent and important is with nursing service.

III. Qualifications:

A. Education and formal training: basic ability to read and understand simple instructions. Completion of 12th grade (high school) or by equivalent of outside study
B. Work experience: no work experience is required.
C. Knowledge, skills and abilities required: knowledge and ability to perform required schedules after a specified amount of training.
D. Special conditions: frequent mental and physical demands. High level of physical demand.

IV. Major Job Functions:

1. Thoroughly clean patient rooms daily. This means following the established seven-step cleaning procedure.
2. Clean, sanitize and put fresh linen on the bed following patient discharge.
3. Clean all ancillary areas daily.
4. Clean office areas.
5. Distribute paper products.
6. This job description is not intended to be all-inclusive, and employee will also perform other duties as assigned by immediate supervisor and other management as required.
7. The medical center reserves the right to revise or change job duties and responsibilities as the need arises. This job discription does not constitute a written contract of employment.

PREPARED BY: _____

APPROVED AND REVIEWED BY:
DEPARTMENT HEAD _____ DATE 2/26/91

HUMAN RESOURCES _____ DATE 2/26/91

EMPLOYEE ACKNOWLEDGEMENT:
EMPLOYEE _____ DATE _____

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Subject: Grievance Procedure — Policy No: 1205.1

Section: Miscellaneous — Manual: Personnel

PURPOSE:

To provide the employee with an easily accessible and fair means of being recognized and heard.

To alert management in a systematic way to causes of employee dissatisfaction and provide opportunities to eliminate them.

To provide a formal mechanism to ensure prompt and equitable response.

To contribute in a positive way toward the development of mutual respect and trust through communication between Medical Center supervision and employees.

POLICY:

It is the policy of the Medical Center to provide employees with an opportunity to present their concerns, questions, or complaints about a work related problem and appeal decision to management through a formal complaint and grievance procedure.

I. Nature of Grievance:

A grievance is defined as an employee's expressed feeling of dissatisfaction concerning a work related problem.

II. Assignment of Responsibility:

A. Employees:

An employee who wishes to process a complaint or grievance is responsible:

1. To make initial contact with his immediate supervisor, department head or Personnel Director for a hearing and opportunity to resolve the complaint.

3000 St. Matthews Road ■ Orangeburg, South Carolina 29115-1498 ■ (803) 533-2200 ■ FAX 533-2304

2. At step two (2) in the grievance procedure, to submit a written statement giving a brief description of the complaint or grievance and the remedy sought. Where reasonable accommodation is sought, the accommodation must be described. Where other relief or other remedy is sought, it must be described. Assistance in writing this statement may be provided by personnel director/designee upon request.

3. To conduct himself in a courteous and businesslike manner during such proceedings.

B. Administrative and Supervisory Staff:

Members of the administrative and supervisory staff shall be responsible:

1. To establish a climate and relationship with the employee which will permit the employee to feel free to voice his complaint and/or grievance.

2. To undertake such investigation as may be necessary to provide full information on all aspects relating to the complaint or grievance.

3. To reach a decision within a reasonable time. The time limit to reach a decision may be extended by the Director of Personnel, if the request is made prior to its expiration.

4. To initiate corrective action when such is considered appropriate.

C. Personnel Department:

The Director of Personnel or his designee shall be responsible for administration of the Employee Grievance Procedure and shall specifically be responsible:

1. To advise, assist and provide services as requested to any party involved in the Grievance Procedure.

2. To monitor all proceedings to insure that procedures are followed and to insure decisions throughout the proceedings move along as promptly as possible.

III. General Comments:

A. A grievance is a complaint by an employee concerning a working relationship and other work related problems. In addition, it is an allegation that there has been a violation, misinterpretation or unfair application of the Medical Center's guidelines for policy and procedure. The grievance procedure can be used to appeal performance evaluations, late evaluations, disciplinary measures, etc. These are just a few examples of what this procedure can be used for and is not meant to be all inclusive.

B. Employees should be encouraged to use the grievance procedure and must not, under any circumstances, be penalized or discriminated against for doing so. Department heads/supervisors are responsible for ensuring that the grievance is properly processed until the employee is satisfied with the decision or until all the steps for appeal have been exhausted.

C. An employe who has a handicap question or complaint will use the regular employee grievance procedure as outlined in this policy.

D. A grievance will be processed as outlined in the procedure section of this policy. The Director of Personnel may extend the time limit at any step in the grievance procedure upon request provided it is made prior to its expiration.

E. Supervisors are encouraged to request assistance from their department heads/Personnel Director in the handling of all grievances.

F. Time spent by an aggrieved employee in grievance discussions with management during normal working hours will be considered hours worked for pay purposes.

G. Management decisions on grievances will not be precedent setting nor binding on future grievances unless they are officially stated as Medical Center Policy.

Subject: Grievance Procedure	Policy No: 1205.4
Section: Miscellaneous	Manual: Personnel

IV. Grievance Procedure:

First Step		
	Employee	-presents his concern to his immediate supervisor or department head <u>within ten (10) calendar days</u> after he became aware of the facts on which the grievance is based
	Supervisor	-evaluates problems and attempts resolution or renders decision within five (5) working days
Second Step		
	Employee	-if the grievance is not settled in the first step, the employee presents his concern in writing to his department head or to the Director of Personnel
	Department Head	-either replies in writing or meets with the employee, evaluates the problem and attempts resolution or renders decision within five (5) working days after supervisor reaches decision
	Personnel Director	-makes an appointment for the employee with the appropriate member of the Administrative Staff, if the department head rendered a decision in the first step
	Administrative Staff Member	-either replies in writing or meets with the employee, evaluates the problem and attempts resolution or renders a decision within five (5) working days after department head reaches decision

Subject: Grievance Procedure	Policy No: 1205.5
Section: Miscellaneous	Manual: Personnel

Third Step	
Employee	-if the grievance is not settled after the second step, the employee presents his concern to the Personnel Director in writing
Personnel Director	-makes an appointment for the employee with the appropriate member of the Administrative Staff or the Medical Center President
Administrative Staff Member or Medical Center President	-either replies in writing or, meets with the employee, evaluates the problem and attempts resolution or renders decision within five (5) working after department head or administrative staff reaches a decision
Fourth Step	
Employee	-if the grievance is not settled after the third step, the employee presents his concern to the Personnel Director
Personnel Director	-makes an appointment for the employee with the Medical Center President
Medical Center President	-either replies in writing or meets with the employee, evaluates the problem and attempts resolution or renders final decision within five (5) days after administrative staff member reaches a decision

Written: 12/3/87

Revised: 12/19/90

Authorized by: _____
President

THE REGIONAL MEDICAL CENTER

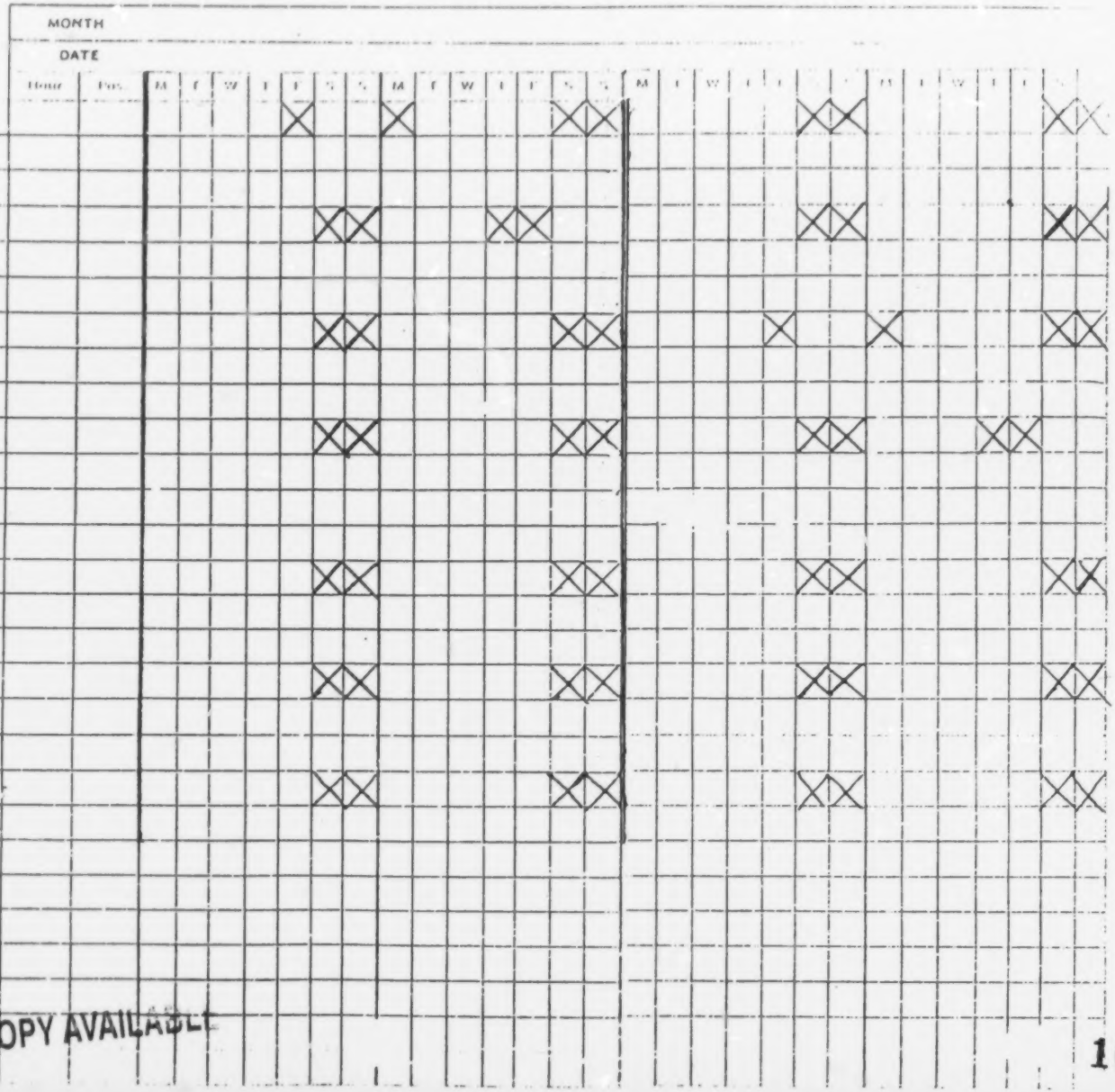
of Orangeburg & Calhoun Counties

WORKING SCHEDULE

LOCATION

BEGINNING DATE

ENDING DATE



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THE REGIONAL MEDICAL CENTER

of Orangeburg & Calhoun Counties

WORKING SCHEDULE

LOCATION

BEGINNING DATE

ENDING DATE

MONTH

DATE

Name	Hour	Pos.
William Asbury - Carpet		
Ellis Mack - Tile		
Anthony Ellison - Trash		
James Fordham - Relief		
Mark Thomas - Projects		
Clifford Colter - O.R.		
Joyce Sharperson - Cancer Center		

WEEKLY INSPECTION REPORT

Facility _____ Date _____

ENTRANCE, LOBBY

1. Entrance walk free of litter?	10
2. Entrance glass free of smears?	10
3. Walls clean and free of spots?	9
4. Lights clean and clear?	7
5. Furniture arranged neatly and orderly?	8
6. Floor finished with depth shine? (or carpet clean?)	15
7. Corners and baseboards clean?	14
8. Public restrooms clean and free of litter?	15
9. Wastebaskets clean with fresh liner?	6
10. Vents clean?	6
TOTAL	____

Bldg _____ Floor _____ Area/Dept _____ Room _____

DEPARTMENTS AND OFFICES

	DEPT.	OFF.
1. Windows clean?	8	8
2. Walls clean and free of spots?	10	10
3. Vents clean?	8	8
4. Lights clean and clear?	10	10
5. Counters clean?	10	10
6. Furniture clean?	10	10
7. Wastebaskets clean with fresh liner?	8	8
8. Floor clean of dirt, dust and litter?	12	12
9. Floor finished with depth shine? (or carpet clean?)	14	14
10. Restrooms clean?	10	10
TOTAL	____	____

D - Bldg _____ Floor _____ Dept _____

O - Bldg _____ Floor _____ Area/Dept _____ Room _____

PATIENT ROOMS

	Room #1	Room #2
1. Windows clean?	10	10
2. Walls clean and free of spots?	10	10
3. Vents clean?	6	6
4. Lights clean and clear?	8	8
5. Furniture clean?	10	10
6. Wastebasket clean with fresh liner?	8	8
7. Floor clean of dust, dirt and litter?	12	12
8. Floor finished with depth shine? (or carpet clean?)	14	14
9. Curtains, draperies clean?	10	10
10. Restroom clean?	12	12
TOTAL	____	____

1 - Bldg _____ Floor _____ Area/Dept _____ Room _____

2 - Bldg _____ Floor _____ Area/Dept _____ Room _____

CORRIDORS, STAIRWELLS

1. Corridors finished with depth shine? (or carpets clean)	20
2. Corners and baseboards clean?	10
3. Walls clean and free of spots?	10
4. Lights clean and clear?	10
5. Elevator tracks clean?	12
6. Elevator floors clean with depth shine? (or carpet clean?)	12
7. Fire extinguisher cabinets clean?	6
8. Vents clean?	7
9. Are the kickplates shined?	6
10. Stairwell ledges and rails clean?	7
TOTAL	____

Bldg _____ Floor _____ Area/Dept _____ Room _____

COMMENTS: _____

_____

_____

Inspection Made By:

_____ Signature

_____ Signature

1989 THE SERVICEMASTER COMPANY, L.P.

MAINTENANCE/PROJECTS NEEDED

ACTION PLAN FOR UNSATISFACTORY ITEMS OBSERVED

QUALITY RATING

	Possible Score	Actual Score
Entrance, Lobby	100	
Department	100	
Office	100	
Patient Room #1	100	
Patient Room #2	100	
Corridors, Stairwells	100	

Total Score		600	
Quality Percent	113	100%	

DENTAL SERVICES CLAIM FORM

☐ DENTIST'S PRE-TREATMENT ESTIMATE
☐ DENTIST'S STATEMENT OF ACTUAL SERVICES

☐ Blue Shield - Oral Surgery ☐ Dental Insuran
☐ Major Medical ☐ FEP Dental Insurance

PART I - TO BE COMPLETED BY EMPLOYEE

1. PATIENT NAME First Initial Last
2. Relationship to Employee: Self | Spouse | Child | Other
3. Sex: M | F
4. Patient Birthdate: Mo. Day Year
5. If full time student: School City
6. Employee/Subscriber Name: First Middle Last
7. Employee Social Security No./Contract No.
8. Employee/Subscriber Mailing Address
9. Employer (Company) Name and Address
City State Zip
11. Do you or your spouse have any other dental insurance? ☐ Yes ☐ No
If yes, please answer the following questions:
Policyholder's Name:
SSN or ID No.:
Name and Address of Policyholder's Employer
10. I hereby authorize release of any information relative to this claim to the insurer and direct that benefits be made payable to: ☐ Dentist ☐ Myself
Date Employee or Spouse Signature

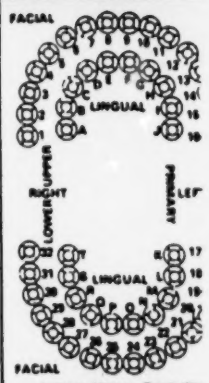
PART II - TO BE COMPLETED BY ATTENDING DENTIST

	No	Yes	If YES, enter brief description and dates	
12. Is treatment result of occupational illness or injury?				
13. Is treatment result of auto accident?				
14. Other accident?				
15. Are any services covered by another plan or Medicare B?				
16. If prosthesis, is this initial placement?			(If NO, Reason for Replacement)	17. Date of Prior Placement
18. Is treatment for orthodontics?			If services already commenced Enter: Date of case diagnosis	

Ilances Placed Mos. Treatment Remaining

19. REMARKS FOR UNUSUAL SERVICES

X-Rays submitted ☐ Yes ☐ No



11. Indicate Missing Teeth Wit An "X"

20. EXAMINATION AND TREATMENT PLAN. LIST IN ORDER FROM TOOTH NO. 1 THROUGH TOOTH NO. 32.

A Tooth No. or Letter	B Surface	C Date of Service	D Place of Service *	E Procedure Code	E Modifiers	Description of Services (Including X-rays, prophylaxis, materials used, etc.)	F Diagnosis Code	G Charges	H (For Administrative Use Onl Type Svc	Days Units	MP SPI	AC Code	Disp

21. Signature of Dentist
(I certify that the statements on the reverse apply to this bill and are made a part hereof.)
Signed Date

26. Accept Assignment *(See back)*
Yes ☐ ☐ No

27. Your Social Security No.

28. Your Employer I.D. No. 114

22. Your Patient's Account No.

23. Total Charge | 24. Amount Paid | 25. Balance D

29. Physician's or Supplier's Name, Address, Zip Code and Telephone No.

I.D. No.

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2/83 *PLACE OF SERVICE CODES
1 - Inpatient Hospital 4 - Patient's Home 7 - Nursing Home 0 - Other Locations

CLAIM FORM INSTRUCTIONS

PLEASE BE SURE TO CHECK THE APPROPRIATE BLOCK ON THE FRONT OF THE CLAIM FORM (I.E. BLUE SHIELD - ORAL SURGERY, DENTAL INSURANCE, MAJOR MEDICAL, OR FEP DENTAL INSURANCE).

ITEMS 1-11 — MEMBER INFORMATION

The patient provides information on Items 1-11 in order for the coverage to be identified. (Note: *All* items must be completed before we can process your claim.)

ITEMS 12-29 — DENTIST INFORMATION

Please complete Items 12-29.

SIGNATURE ITEM 21:

I certify that I personally performed the described services or they were performed by my employee under my immediate personal supervision.

ASSIGNMENT ITEM 26:

When I mark Item 26 "YES" and properly complete this claim form, I understand that any covered benefit payment will be made directly to me.

When I mark Item 26 "NO" or fail to mark it either "YES" or "NO", I further understand that any covered benefit payment will be made directly to the insured subscriber.

ITEM 27:

Complete this item if you are in a solo-practice or member of a group practice and filing in your name.

ITEM 28:

Complete this item if filing under a corporation name.

A pre-determination of benefits can be made only when such charges for the course of treatment to be performed will exceed $100.00. For such cases please complete all items on the claim form except Item No. 20C (date(s) of service) indicating the treatment plan and the estimated charges and mail to the address below. A pre-determination form will be returned to you indicating the allowable amount. This amount is always subject to the deductible and co-insurance provisions of the contract. Upon completion of the services indicated on the treatment plan, enter the date(s) the services were performed and submit the pre-determination form for payment of benefits. NOTE: There is no preauthorization of benefits for the FEP Dental Insurance program.

MAIL COMPLETED INSURANCE FORMS TO:

BLUE CROSS AND BLUE SHIELD OF SOUTH CAROLINA
P.O. BOX 6000
GREENVILLE, SC 29606

TRMC The Regional Medical Center
of Orangeburg & Calhoun Counties

Subject: Cafeteria | Policy No: 402.1

Section: Benefits | Manual: Personnel

Policy:

The Regional Medical Center operates a cafeteria for the convenience of Medical Center employees, students, medical staff, official Medical Center guests and other authorized guests.

I. Hours of operation:

A. Meals are served as follows for employees:

Breakfast	6:15a.m. to 8:00a.m.
Coffee Break	8:30a.m. to 10:30a.m.
Dinner	11:00a.m. to 1:30p.m.
Supper	4:30p.m. to 6:30p.m.

B. Meals are served as follows for visitors:

Breakfast	6:15a.m. to 8:00a.m.
Coffee Break	8:30a.m. to 10:30a.m.
Dinner	12:30p.m. to 1:30p.m.
Supper	4:30p.m. to 6:30p.m.

C. China, glassware and eating utensils are not to be taken from the cafeteria (see Policy Letter 111 #35).

Written: 11/17/81, 7/17/86, 12/17/87

Revised: 11/21/90

Authorized by: _____
President

3000 St. Matthews Road ■ Orangeburg, South Carolina 29115-1498 ■ (803) 533-2200 ■ FAX 533-2304

Subject: Retirement/Pension Plan | Policy No: 412.1

Section: Benefits | Manual: Personnel

Purpose:

To outline the policies and procedures to be followed in the Administration of The Regional Medical Center's pension plan.

Policy:

Because of the interest of the Medical Center in the welfare of its' employees a retirement plan was adopted on January 1, 1969.

I. Eligibility:

On January 1, 1969 when the Medical Center adopted the retirement plan, the following criteria had to be met to be eligible for benefits:

A. All full-time employees who were not sixty-five (65) years old or older when employed and who had completed three (3) years of continuous services on December 31, 1978, were included in the plan. Other full-time employees became eligible when they fulfilled the three (3) year service requirement.

B. All physicians, student nurses, students and any temporary, part-time, seasonal employees employed for less than twenty (20) hours per week were not eligible to participate.

C. Employees hired after December 31, 1968, who were age fifty-five (55) or older were not eligible to participate.

On January 1, 1976 the plan was modified with the following provisions taking effect:

A. If you were a participant in the prior plan on December 31, 1975, you automatically became a participant in the current plan on January 1, 1976.

B. If you were not a participant in the prior plan, you will become a participant on the day you complete your first twelve (12) months of employment if you have at least one thousand (1,000) hours of service during that twelve (12) month period.

C. If you do not satisfy either of these requirements, you will become a participant on the January 1st following the first calendar year in which you have at least one thousand (1,000) hours of service. All participants must work at least one thousand (1,000) hours per calendar year.

D. An hour of service is any hour for which you are directly paid by the Medical Center as well as any hour for which you are indirectly paid (such as back pay, paid vacation, temporary sickness or temporary disability).

E. You will not be eligible to become a participant, however, if you start your employment with the Medical Center for the first time after January 1, 1969, and you have reached your sixtieth (60) birthday at that time. If you are a student nurse or a physician, you will also not be eligible to become a participant. The above stated provisions are currently in effect.

II. General Provisions:

A. The cost of the plan is paid entirely by the Medical Center; the employee makes no contributions to the plan.

B. The amount of the normal retirement benefit will be determined on the basis of the number of year of service the employee has completed with the Medical Center and the amount of the employees average pay reported on the employee's W-2 form for the employee's years of service.

C. If the employee does not complete more than five hundred (500) hours of service during a calendar year a break in service will be incurred.

D. The employee's normal retirement age is sixty-five (65). The normal retirement date will be the first day of the month on or after the employee reaches his normal retirement age. A provision for disability retirement is also included in the plan. An employee may elect early retirement with reduced benefits if he has attained age fifty-five (55) and has fifteen (15) or more years of service.

E. IMPORTANT NOTES: Employees contemplating retirement should notify their Department Head and the Controller at least three (3) months in advance of the anticipated retirment date to avoid any delay in receiving the retirement check. Social Security: Employees retiring who are eligible to draw Social Security benefits are also advised to contact the local Social Security Office at least three (3) months prior to the anticipated retirement date to avoid any delay in that process.

F. Death Benefits: If the employee dies before he is eligible for early retirement, no death benefits will be paid.

G. The above information and much more detailed information including how the plan works, how the years of service are determined, break in service affecting the benefit, how the benefit is delayed retirement, vesting, etc. are contained in the booklets available in the Plan Administrator's Office and the Personnel Office. The Plan's full legal text, however, governs the operation and administration of the Plan. If there is any conflict between the booklet and the legal documents, the terms of the documents will rule. Copies of the legal documents may be obtained for a reasonable charge by filing a written request with the Plan Administrator.

III. Tax Deferred Annuity:

If an employee wishes to supplement his retirement income, he has the right as an employee of the Medical Center (which is a non-profit, tax-exempt organization covered under section 501 (c) (3) of the Internal Revenue Code) to request a reduction of his wages to purchase annuity benefits payable upon his retirement. The deduction for Federal withholding (Income taxes) is based on salary remaining after the annuity contribution has been deducted. Federal Income tax on these excluded wages is deferred until the annuity benefits are received by the employee's reduced income after retirement. Brochures describing the plan are available in the Personnel Department; and employees who wish to talk with the company representative about the plan should contact the Personnel Department.

Subject: Retirement/Pension Plan | Policy No: 412.4

Section: Benefits | Manual: Personnel

IV. Conversion Privileges - Health Insurance:

Employees retiring, who at the time of retirement have been covered by the group health insurance policy for three (3) months preceding, have a right under state law to maintain their insurance coverage on the group plan for the fractional policy month remaining at retirement plus one (1) additional policy month on the group plan, upon payment in advance by cash, money order or certified or cashier's check, the amount of premium due, to provide coverage on the group plan for this period of time. Anytime an employee on the group plan becomes ineligible for the group plan, and is taken off the plan the Personnel Department notifies the carrier to mail to the employee conversion rates and application to the employee's home address, unless requested not to do so by the employee. The health insurance carrier provides a conversion contract which can be taken by the employee who is no longer eligible for coverage under the group plan provided that the employee makes written application and pays the carrier the first premium within sixty (60) days of retirement; however, failure by the employee to apply to the carrier for the conversion contract within thirty-one (31) days from this same date can result in an interruption of coverage.

Medicare Supplement:

The health insurance carrier also offers a conversion policy in the form of a supplemental health insurance plan (which pays Medicare deductables) for employees who are eligible for Medicare coverage when they retire at age sixty-five (65).

V. Group Life Insurance:

Full-time employees who are covered under The Regional Medical Center group life insurance plan and who are retiring can convert their group term life insurance coverage to an individual policy with no medical exam as a requiremen. The life insurance carrier allows thirty-one (31) days from the day that the retiring employee's coverage ends (date of employee's retirement) to apply for conversion contract with the Group Life carrier.

Subject: Retirement/Pension Plan	Policy No: 412.5
Section: Benefits	Manual: Personnel

Employee's retiring are advised to check with the Personnel Department on converting their Health and Life Insurance.

VI. Summary:

The information contained in this policy summarizes some of the principal provisions of the Retirement/Pension Plan although legal contracts govern the operation and administration of the plan. Should there be a conflict between policy and contract, the legal contract rules.

Written: 03/11/88

Revised: 11/21/90

Authorized By: _____
President

The ServiceMaster Company
2300 Warrenville Road
Downers Grove, IL 60515

MATERIAL SAFETY DATA SHEET

(Complies with 29 CFR 1910.1200)
Emergency Telephone Number (708) 964-1300

SECTION I

Product (Trade) Name	-	SaniMaster III		
EPA Registration No.	-	6109-17		
Manufacturer's Name	-	The ServiceMaster Company		
Address	-	2300 Warrenville Road - Downers Grove, IL 60515		
Emergency Telephone No.	-	(708) 964-1300		
Chemical Name and Synonyms	-	N/A	**DOT Hazard Class:**	Nonhazardous
Chemical Family	-	N/A	**ID Number:**	None
Formula:	-	N/A		

SECTION II - HAZARDOUS INGREDIENTS

Ingredient	C.A.S. No.	% by Wt.	OSHA PEL	ACGIH TLV	Other Limits (ACGIH STEL)	Listed as Carcinogenic by IARC, NTP, OSHA, ACGIH
Quaternary ammonium chlorides	32426-11-2 68424-85-1 68424-95-3	5-7	N/E	N/E	N/E	No
Sodium hydroxide	1310-73-2	0.5	2 mg/m3C	2 mg/m3C*	N/E	No
Ethyl alcohol	64-17-5	0.8-1.3	1000 ppm	1000 ppm	N/E	No

*C = Ceiling value. Not to be exceeded at any time during the work shift.

In accordance with OSHA's Hazard Communication Standard, ingredients listed in this section are those identified as being hazardous and present at concentrations greater than 1%, or greater than 0.1% if the substance is a listed carcinogen. Information concerning ingredients identified as "Proprietary" will be made available as provided in 29 CFR 1910.1200(i).

SECTION III - PHYSICAL DATA

Boiling Point (°F):	> 212	**Specific Gravity (H_2O = 1):**	1.066
Vapor Pressure (mm hg.):	N/D	**Percent Volatile By Weight:**	71-73
Vapor Density (Air = 1):	>1	**Evaporation Rate (water = 1):**	~ 1
Solubility in Water:	Completely soluble.		
Appearance and Odor:	Colorless liquid with slight ammonia-like odor.		
pH of Concentrate:	12.9	**pH Diluted for Use:**	10.5

SECTION IV - FIRE AND EXPLOSION HAZARD DATA

Flash Point (Tag. Closed Tester): >200°F **Flammable Limits:** LEL N/A UEL N/A

Extinguishing Media: Noncombustible. Use media appropriate for materials actually involved in fire.

Special Fire Fighting Procedures: Self-contained breathing apparatus and protective clothing should always be worn in fighting fires involving chemicals.

Unusual Fire and Explosion Hazards: None known.

SECTION V - HEALTH HAZARD DATA

Primary Route(s) of Exposure: Skin contact.

Threshold Limit Value: N/D. See Section II for TLV of Hazardous Ingredients.

Effects of Overexposure

- **Acute**
  - **By Inhalation:** Inhalation of mist may cause irritation.
  - **By Eye Contact:** Serious irritation, chemical burns possible.
  - **By Ingestion:** Irritation of mouth, throat, and stomach. Corrosive effects on mucous membranes.
  - **By Skin Contact:** Irritation.
- **Chronic:** Repeated or prolonged contact with skin may result in dryness or irritation.
- **Medical Conditions Generally Aggravated by Exposure:** None known.

Emergency and First Aid Procedures

For Inhalation:	Remove to fresh air.
For Eye Contact:	Immediately flush with plenty of water for at least 15 minutes. Lift upper and lower lids occasionally. Call a physician.
For Ingestion:	Give a large quantity of milk, egg white, gelatin solution, or several glasses water. Do not induce vomiting.
For Skin Contact:	Wash thoroughly for at least 15 minutes with running water. Remove and launder contaminated clothing.

SECTION VI - REACTIVITY DATA

Stability: Stable. **Conditions to Avoid:** None known.
Incompatibility (Materials to Avoid): None.
Hazardous Decomposition Products: None known.
Hazardous Polymerization: Will not occur.

SECTION VII - SPILL OR LEAK PROCEDURES

Steps to be Taken in Case Material is Released or Spilled - Small amounts may be flushed to sanitary sewer. Larger amounts - add acetic acid to neutralize. Absorb with sand, clay, vermiculate, or other absorbant.

Waste Disposal Method - Pick up with shovel. Dispose of in an approved landfill in accordance with Federal, State, and local regulations. Un-neutralized material must be disposed of as corrosive hazardous waste. Dispose of all waste in accordance with local, State, and Federal regulations.

Hazardous Waste Classification: D002

SECTION VIII - SPECIAL PROTECTION INFORMATION

For Handling Product as Supplied

Respiratory Protection	- If TLV is exceeded, use NIOSH-approved organic vapor respirator.
Ventilation	- Sufficient ventilation should be provided to maintain exposure below TLV.
Protective Gloves	- NBR or rubber.
Eye Protection	- Chemical splash goggles or face shield.
Other Protective Equipment	- Use impervious apron and/or clothing as needed to prevent skin contact.

For Handling Product After Dilution For Use

Respiratory Protection	- If generation of respirable mist occurs, use NIOSH-approved dust and mist respirator.
Ventilation	- Normal ventilation satisfactory.
Protective Gloves:	- Not normally required.
Eye Protection:	- Not required.
Other Protective Equipment:	- Not required.

SECTION IX - SPECIAL PRECAUTIONS

Precautions to be taken in handling and storing: Store in a tightly closed container in a cool, dry location.

Other precautions: Use only according to instructions on label. Empty container may be hazardous. Follow directions on label for disposal. It is a violation of Federal Law to use this product in a manner inconsistent with its labeling.

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Approved by: David L. Coleman, Ph.D.
Title: Director, Product Development and Quality Control

Date of Preparation: April 6, 1990
Supercedes previous form dated: May 10, 1989

N/A - Not Applicable N/D - Not Determined N/E Not Established

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